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ABSTRACT

The purpose of this study was to gain some insight into the competencies and experiences needed by professional personnel at the doctoral level for optimum preparation in the field of instructional technology. The higher institutions selected as the population sample were the University of Southern California, Michigan State University, Syracuse University, and Indiana University. Information was gathered from catalog listings , course syllabi, promotional brochures, and student handouts, as well as from a written questionnaire sent to randomly selected students, graduates, and staff. Recommendations were sought from scholars, innovators, and philosophers in the field. The related literature was reviewed. The result of the information-gathering process was an in-depth view of the process of doctoral education in instructional technology as it exists today and a set of guidelines for improving this process in the future. A bibliography, samples of the forms used to gather information, and a statistical analysis of the data are appended. (JY)

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AN ANALYSIS OF THE DOCTORAL LEVEL PREPARATION PROGRAMS IN THE FIELD OF INSTRUCTIONAL TECHNOLOGY AT SELECTED INSTITUTIONS

By

Glenn Gardner Snow

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ABSTRACT

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The purpose of this study was to gain some insight into the competencies and experiences needed by professional personnel at the doctoral level for optimum preparation in the field of Instructional Technology.

The higher education institutions selected as the population sample are those that comprise the University Consortium in Educational Media and Technology. They are The University of Southern California, Michigan State University, Syracuse University, Indiana University, and the Oregon System of Higher Education. Inasmuch as the Oregon System does not have a doctoral level program in Instructional Technology, it has not been included in this study.

Information was collected from a number of sources. The determination of course offerings, program content, and related work was made from catalog listings, course syllabi, promotional brochures, and student handouts. "Field perceptions" of personnel from the four institutions were determined by a written questionnaire sent to randomly selected students, graduates, and staff. Responses to the items on the questionnaire were treated statistically to determine consistency, consensus, and/or

variance. To temper the findings from these two sources, recommendations from "scholars," "innovators," and "philosophers" in the field were incorporated in the overall consideration.

Findings

1. There is agreement as to the relative desirability or hierarchy of particular elements to be included in the optimum preparation program for doctoral level people in the field of Instructional Technology. Specifically, experiences with learning and communications theory, systems theory and design, educational psychology, research method and design, selection and use of instructional materials and media equipment, the administration of media facilities, and curriculum design and development, are key elements in the preparation program at this level.

2. There is disagreement as to the value of an internship experience in Instructional Technology. Areas considered "desirable" deal with an overview of media materials and equipment, use of classroom television, programmed instruction, design of media facilities, and teaching experience. The "tool" areas; i. e., photography, graphics, production, cinematography, business administration, and statistics rated lower than did the "theory" or "academic" areas in the perception of those in the field.

3. The foreign language requirement for the doctoral degree is considered inappropriate. Library skills, basic electronics, and administrative experience in education also received low value ratings.

Implications of the Study

Preparation programs can never remain static. They must be subject to constant assessment and revision. Change is the only constant. If preparation of the doctoral level person is to be functional it must be flexible enough to shift with the demands of society and stable enough that it does not collapse in the process.

Some arrangement that will permit both students and staff to work together in teams with definite objective and an opportunity to solve real problems rather than be limited by the traditional course - seminar type of operation is necessary to permit the introduction and use of all the experiences that are deemed to be essential. This type of operation is necessary at both the "general core" area and the speciality areas.

The institutions included in this study are currently making a concerted effort to make their programs more functional for their advanced graduate students. A set of suggested "guidelines" for new programs is included in the study.

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To all those who have helped to bring this quest for additional educational experience to a successful plateau, the writer is indebted. Without their help, the work could never have been completed.

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS

The development of instructional technology might be considered as concurrent with that of the growth of formal instruction. The caveman, as he attempted to communicate by placing crude drawings on the walls of his dwellings, was the first "visual" technologist. Saettler refers to the early Sophists as the "ancestors of instructional technology" and notes that some of the early contentions of Plato with the Sophists related to the conception that they had of the role of techne in the instructional process.[1] Using figures in the sand as a visual medium is well known to those who studied Euclidean geometry before the advent of "modern mathematics." The fact that the majority of citizens in the Greco-Roman Empire were literate is well documented. It is assumed that as the "barbarians" destroyed these civilizations, this literate state was lost. An interesting contention is made by Highet. He says:

> Most of the townsfolk and city people in the Greco-Roman civilizations, and numbers of the farmers, had been literate, as we know from the wide

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[1] Paul Saettler, A History of Instructional Technology, New York, McGraw-Hill Book Company, 1968, p. 15.

> distribution of literature and the many inscriptions put up all over the empire. But illiteracy came in with the barbarians, and settled down for centuries. It was almost universal in the Dark Ages. It was widespread in the Middle Ages, as we can see from shop signs and coats of arms. If your soldiers cannot read, you put up a shield azure with three rose gules upon it, to tell them their master's name and descent. If your customers cannot read it is useless to put up a sign saying PAWNBROKER: you hang out three golden balls, borrowed from the coat of arms of the Medici bankers.[1]

The importance of the use of visual symbols as a precursor of a return to a literate state is doubly emphasized in such an illustration. Before any individual, regardless of the level of culture or society that he lives in, can make meaningful use of the graphic symbols we call printing he must make some abstraction of his personal experience. Many scholarly arguments may be traced to the concern on the part of educational leaders and practitioners with the place of the concrete-abstract continuium in the learning process.

The development of instructional technology has been significantly influenced by such educational leaders as Comenius, who proposed a different kind of teaching awareness when he wrote the Great Didactic[2] and followed it with a practical example, Orbus Pictus (The World in Pictures);[1] and by such men as Rousseau who postulated that children should be educated in accord with their own natural interests. Others, such as Pestalozzi, following the lead of Rosseau, suggested "natural, harmonious" development in the expansion of thinking about methods of instruction. Piaget and Bruner have talked and written about active learning and the ever-increasing boundaries of individual growth that comes from a cognitive approach to the learning process.[2] Thoughts and propositions such as these have all had a laudatory effect upon the development of instructional technology.

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[1] Gilbert Highet, The Art of Teaching, New York, Vintage Books, Inc., 1954, p. 199.

[2] Johann Amos Comenius, The Great Didactic, First English Edition, University of Chicago Press, Chicago, 1953, Translated by Vladimir Jelenik, p. 239. (Original version, 1633).

Recent history has placed an increasingly significant emphasis upon the role of formal education in our present society and has also served to re-assert the importance of technology within the educational complex that serves society. Though there is less than total agreement as to the causes of this increased interest in the educational mainstream, it is generally recognized that it was shortly after Sputnik that American public education, with all its alleged inadequacies, moved into center stage.

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[1] __________________, Orbus Pictus - The World in Pictures: Visible World or a Nomenclature and Pictures of All the Chief Things in the World, written by the Author in Latin and High Dutch, Translated into English by Charles Hoole, Little Britain, 1728.

[2] Saettler, loc. cit., p. 22. See also, W. R. Fulton and Fredrick A. White, "What Constitutes Teacher Competence in Audio-Visual Communication?" Phi Delta Kappan, Vol. XXXX, No. 4, (January 1959), p. 158.

The immediate federal reaction, in the form of legislation known as the National Defense Education Act, was viewed by some as Pandora's Box. It cannot be denied, however, that appreciable changes have taken place in American education since the Act was passed. The original version of the National Defense Education Act did not mention "instructional materials" or "media" *per se*. Title III of the Act did specify "equipment" and this was interpreted in most states to include "instructional materials" and media equipment. The implementation of Title III made the acquisition of these materials and equipment possible for public schools throughout the country and, in effect, awakened a new interest in the utilization of the "materials of instruction." Token provision was also made for the Summer Institutes to give additional training and educational experience to the teachers of science, mathematics, and modern foreign language.

Subsequent legislation made provision for the extension of both equipment allotments and the Institute idea into other disciplines. By 1967 the fields included were: Arts and Humanities, Civics, Counseling and Guidance, Disadvantaged Youth, Economics, Educational Media, English, English for Speakers of Other Languages, Geography, History, Industrial Arts, International Affairs, Modern Foreign Languages, and Reading.[1] The guidelines of the United States Office of Education indicated that one of the responsibilities of the Director of each of these Academic Institutes was to include the development and utilization of media in the preparation and presentation of the scholarly material included in the Institute.

This phase of the Institute program was not recognized nor well defined at the outset. As a result ancillary kinds of organizations have been formed to help alleviate problems that have developed as the specialists in the various disciplines attempted to mediate their expertise. Following a number of discussions and planning conferences, an initial step in the formulation of these organizations was the drawing of a contract between the United States Office of Education and the University of Southern California to conduct a series of "Special Media Institutes (SMI)" for the Directors of the Academic Institutes. Overall growth in this program made it practical for other higher education institutions to enter into this relationship, essentially as sub-contractors. Since 1965 these institutions have formed what has come to be known as the University Consortium in Educational Media and Technology. The members of the Consortium are: The University of Southern California, Indiana University,

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[1] The Mediated Dialogue, An Account of the Experimental National Media Institutes, Department of Instructional Technology, University of Southern California, 1967, p. 4.

Michigan State University, The Oregon System of Higher Education, and Syracuse University. Most of the institutions have conducted or are conducting Special Media Institutes at this time (1969). Indiana University, however, has not been an active participant in the Special Media Institute program.

It has not been assumed that the Special Media Institute program was a direct cause of increased interest in advanced graduate programs in the field of Instructional Technology/Educational Communications. These institutions have long been recognized as leaders in the pre-service preparation of professional personnel in this area. It would appear, however, that the S. M. I. operation has served as a catalyst for increased institutional involvement in the doctoral level programs in the field. Schuller says, for example:

> It should be noted that the four universities (M. S. U., U. S. C., Syracuse, and Indiana) all have operated leading advanced-graduate level programs for the professional training of educational media personnel for approximately the last decade. A very large share of the individuals holding doctorates who are now working in the field have received their training during the last five to ten years at these institutions.[1]

The problem of adequate personnel and well prepared manpower is a major concern of any functioning program. It is a very real problem in the field of Instructional Technology. Recent federal action in terms of educational programs for larger groups of instructional personnel has accentuated the importance of well conceived and developed programs to meet an ever-expanding need. Ely comments on the situation this way:

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[1] Charles F. Schuller, "Project Proposal to the United States Office of Education - A Project to Generate an Improved Professional Program in Instructional Development and Educational Technology," December 1, 1968, p. 6.

> At a time when educational technology is accepted as a fact, the demands upon personnel in the field have far exceeded the number of people available. Problems which exist on local and regional levels extend to the state and national scene. No longer is it possible for one institution to serve state-wide and national demands while continuing to provide local and regional services. With developments in the field occurring so rapidly in many parts of the country and the world the need for immediate communications among practicing educational technologists is urgent.[1]

Specific concern about the present preparation program is voiced by West:

> Who is training this educational specialist today? For the most part his training program seems to be trial and error learning. . . . the time has come for the numerous talents and resources in schools and colleges to be identified, carefully selected, and put to work developing a new program to train the educational media specialist more effectively.[2]

It has been indicated that one of the purposes of the Consortium is to "improve graduate education in the field."[3] It should not be implied that this "improvement" is to result in identical programs in the institutions that form the UCEMT. The intent has been to identify the basic nucleus for the curriculum and to have sufficient flexibility in the design "to allow each institution to accent the program with its unique strength, expertise, and previous experience."[1]

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[1] Donald P. Ely, "Consortium in Educational Media and Technology," Educational Technology, Vol. IX, No. 1, (January 1969), p. 33.

[2] L. Clinton West, "A New Partnership Is Needed!," Audiovisual Instruction, Vol. XIII, No. 8, (October 1968), p. 926.

[3] Ely, loc. cit., p. 33.

Current (1969) interest is at an all time high in all areas of education. Much discussion has ensued relating to differentiated assignments and the roles of persons working at all levels within education. These discussions have been of particular concern to those working in Instructional Technology because the role assignment in this area is somewhat elusive. Much of the debate has centered around the degree of expertise and the range of qualifications required at the various levels of professional assignments.

Though there has been marked increase in the number of media courses offered at the graduate level at the universities throughout the country there is little evidence of cooperative work among the institutions in planning or developing curricula for the people who are preparing for the professional levels in the field of Instructional Technology.

The Department of Audio Visual Instruction of the National Education Association is currently involved in a study, "Jobs in Instructional Media Study (JIMS)," funded by the United States Office of Education (1969). Its primary emphasis is upon the para-professional or media support kinds of assignments.[1] The present emphasis of the Professional Education of Media Specialists (PEMS) Commission of the Department of Audio Visual Instruction is directed toward the specialist and/or technician.[2]

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[1] Schuller, loc. cit., p. 9

The preparation of other professional level persons in the field has been the subject of some discussion. This study will attempt to explore and examine programs in Instructional Technology at the doctoral level.

Purpose of the Study

It is the purpose of this study to gain insights and hopefully to begin to answer the following question:

> What competencies are needed by professional level people at the doctoral level; what preliminary experiences are required; and what experiences should be provided within the program for optimum preparation in the field of Instructional Technology?

Plan for the Study

An indication of the current situation (1969), as well as its historical antecedents, has been determined from the literature. Inasmuch as a number of different terms, such as "visual education," "audio-visual education," "media," "instructional technology," "educational communications," and others have been used at different times and places and all appear to be pertinent, all have been included in the literature survey. The competencies and experiences indicated from the review were considered in the formulation of the survey instrument. They were not considered as a comparison group in the statistical analysis of the data obtained from the field through the use of the questionnaire noted below.

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[1] James Wallington, Pryor Hale, Freda Douglas, "Toward Solving the Media Manpower Puzzle," Audiovisual Instruction, Vol. XIV, No. 1, (January 1969), p. 36.

[2] Highlight of Commission and Committee Reports, Audiovisual Instruction, Vol. XIII, No. 6, (June-July 1968), pp. 656-663.

It has been assumed that a pattern of needed experiences and competencies will emerge as information and data from multiple sources are correlated. More information and discussion of this phase of the study will be presented in Chapter III.

The five institutions that make up the University Consortium in Educational Media and Technology are recognized "leaders in the field." The preparation programs and the course offerings from each of these institutions have been critically analyzed. A comprehensive study and analysis of program structure and course outlines as determined from catalog listings, program brochures, and available syllabi has been used to give an indication of the latitude of competencies and experiences incorporated with the programs.

Information was also collected by questionnaire from those people who work in the field. Included in this group from whom "field perceptions" were made are (a) students currently enrolled and recent graduates of the existing preparation programs, and (b) administrative and teaching personnel involved in the programs at each of the institutions included in the study.

Other data have come from those in the field who have not only assumed the administrative roles in the existing programs but who are also on the "cutting edge" of new developments and ideas. These men, sometimes labeled "innovators" or "scholars" or "philosophers" by academicians are assessing the present situation and through writing and speaking are urging a look toward the future. By incorporating their viewpoints, programs can be more effectively designed for the "tomorrows" rather than the "yesterdays."

The information gathered from each of the different sources has been treated statistically to determine (1) if there is consistency within the sub-groups included in the study; i. e. students, graduates, and instructional and administrative personnel; and (2) if there is significant correlation among the various groups and other sources as to what comprises an optimum program for the preparation of people at the doctoral level in the field of Instructional Technology. The treatment and results will be discussed in more detail in Chapters III and IV.

The elements of an optimum program for the preparation of professional personnel at the doctoral level in the field of Instructional Technology will be based upon the information obtained from the multiple sources cited above.

The following is a paradigm of the study:

$$\left.\begin{array}{l}\text{Programs}\\ \text{"Innovators" or}\\ \text{"Philosophers"}\\ \text{Field Perceptions}\end{array}\right\} \longrightarrow \text{Need} \longrightarrow \left\{\begin{array}{l}\text{Proposed}\\ \text{Program}\\ \text{Elements}\end{array}\right.$$

The findings and recommendations of this study will enable the institutions involved in the study to analyze their own programs. Equally important, however, the findings and recommendations may serve as an illustration of the considerations that need to be incorporated in the development of new professional preparation programs.

Assumptions

There are a number of assumptions underlying the study. Some are "givens;" others refer to phases of the relationship among the institutions included in the study.

Such things as the dissertation experience and preliminary screening of candidates were assumed as "givens" in this study. Though the first assumption was uniform in all of the schools the second showed enough variation that the findings have been included in Chapter IV.

It was also assumed, initially, that there were significant differences in the overall preparation programs at the four institutions of higher education selected as the population group. The findings in relation to this assumption are also reported in Chapter IV.

Limitations

There are limitations to a study of this nature. One of the more specific limitations is related to the use of a questionnaire to obtain information. deKeiffer says:

> A questionnaire survey can never be definitive because of the semantic difficulty involved in the interpreting of word symbols between the author and the respondent.[1]

This is a very real problem in an area such as Instructional Technology where there is still much debate as to meanings and inclusiveness of terms. It has shown up in this study in the open-ended responses to suggested items. It was intended that some of the terms be "all-inclusive" and it is obvious that the respondent, in many instances, has made a very narrow interpretation of the terms used. The respondent then added items in the "Comments" sections of the questionnaire form that, in the perception of the writer, were already included.

Similar problems may develop in relation to the explication of written and spoken statements of a number of different people. It is apparent that disagreements and other misunderstandings are caused by a "semantic difficulty" analogous to that cited above. This can be a problem in a statement of philosophy or of an operational procedure.

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[1] Robert E. deKeiffer, "A V Activities of Colleges and Universities in Teacher Education," Audio Visual Communications Review, Vol. 7, No. 2, (Spring 1959), p. 124.

Definition of Terms

The terms cited below have been given operational rather than "dictionary-oriented" definitions.

Admission Requirements those experiences and courses that are preliminary to formal admission to the "degree-seeking" status as a doctoral level student. This may include examinations, previous formal instructional experiences, and other specific requirements that must be completed prior to being admitted to the doctoral program

Certification minimum legal requirements for the professional practice of a given service - usually spelled out by a certification board at the behest of a state governmental agency. Particular reference in this study will be to teaching and/or other specialties in the practice of formal educational programs.

Competencies being functionally adequate or having sufficient knowledge, judgment, or skill to perform the needed functions of an instructional technologist.

Field Perceptions feelings and understandings of those who are working actively as teachers, students, and administrators with educational media and materials. Emphasis in this study is upon the program most directly related to higher education

Instructional Technologist an all inclusive term as it is used in this study, having particular reference to the highest level professionally trained person working in the media field. As Ofeish has said, the technologist has the responsibility for "continued in-depth study of the growing relationships between the 'techne' and the contemporary problems."[1]

Instructional Technology the "application of scientific knowledge toward the solution of problems in education." It has also been called "an applied man-machine system."[2] In this study it has been used to denote the total media field as a kind of "blanket" term that includes such terms as media, audio-visual, and educational communications

Preparation Programs the formal course work, seminars, internships, and/or assistantships offered and/or required of students in completing their responsibilities in relation to a doctoral degree with a major in Instructional Technology

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[1] Gabriel D. Ofeish, "Tomorrow's Educational Engineers," Educational Technology, Vol. VIII, No. 13, (July 15, 1968), p. 6.

[2] Ibid.

Syllabi   outline of the material to be covered and the method of instruction that will be used in the presentation of particular course offerings

ANOVAR   a computer system designed to perform analysis of variance or covariance. Originally developed as a part of the AARDVARK system for the IBM 7040 by Hemmerle and Carney at Iowa State University. "It will perform analysis of variance or covariance for . . . both equal and unequal cell frequencies." Utilizes FORTRAN for the IBM 7040/MAP 44 system.

Summary

Instructional technology and formal education developed concurrently in the time of the early Greeks and Romans. Though formal education seems to have grown more rapidly as man became more able to make abstractions of his experience, the need for technology was never obviated. Through the Dark Ages, as the literacy of the average man was lost, the technology of communicating with pictures appears to have been strengthened. The Renaissance gave man a new opportunity to make more effective use of abstract symbols and reaffirmed the need for increased educational experience.

Within the last few years, once again additional emphasis has been placed on the value of formal education. The advent of the "Space Age" with Sputnik has resulted in increasingly important functions for the public school program. This increase in development of viable educational schemes has brought instructional technology to the forefront.

A number of institutions of higher education have made, and are still making increasingly sophisticated attempts to fill the obvious gaps in the educational spectrum. Known as the University Consortium in Educational Media and Technology, they are working to improve the preparation programs for professional level people in the field of Instructional Technology.

It is the function of this study to assess the experiences and competencies that should be provided for optimum preparation in the field for professional people at the doctoral level.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The review of the literature has been divided into a number of distinctive parts. This has been done for clarity in the development of the ideas proposed for the consideration of the reader. In the Summary to the chapter the most significant factors will be presented so they can be utilized in the other chapters along with the information derived from other sources.

The topics considered in this Chapter are: (1) the general background, including historical efforts to develop and assess the preparation programs for the "visual" as well as the "audio-visual" technologist, (2) the relationship of teacher competency and the way that teachers are prepared for teaching, (3) the role of certification and the general licensing of teachers and their relationship to preparation programs, and (4) some of the current efforts that are being made to assess and improve media preparation programs.

General Background

From the beginning, long before the formally recorded events of history, it is apparent that men have tried to help their children to learn. The basic arts of survival had to be learned. Communication with others had to be learned. Legends such as that of Romulus and Remus to the contrary, human society has developed only as man, himself, has made increasingly sophisticated efforts to teach his children the skills and arts of survival and has developed greater competence in dealing with the buffetings of nature and the relations of one person with another. The anthropologists chose to call this process enculturation and the sociologists call it socialization. Goldschmidt says:

> For the infant taken naked from his mother's womb is naked of culture as well. And all of us, however primitive or civilized we may be, have entered our culture in precisely this way . . . Nothing is more important . . . than to understand the processes by which the naked infant is clad in the uniform of his culture. Only a small part of this process takes place in the schools, even in our stage of civilization.[1]

The history of man's attempts to formally educate himself can be reviewed with little effort. The review brings recognition that in virtually every instance, the "educational process" involves multiple levels of operation, and simultaneous approaches to common concerns.

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[1] Walter Goldschmidt, Exploring the Ways of Mankind, Los Angeles, Holt, Rinehart, and Winston, 1960, p. 172.

Specifically, at one level while teaching is taking place there is also some learning being done, though almost always at a different level. The success of this teaching-learning venture depends upon many variables. Just what happens in this interaction of teacher and learner and the changes that develop in both, merits more serious consideration.

In all cultures, the older and more experienced members of the society have had the responsibility of transmitting; either formally or informally; the skills, ideals, attitudes, and values to the less experienced and more immature. As the cultures develop and become increasingly complex, the educational schemes which support them must also change. In the evolution of the apprenticeship types of training the greater varieties of skill development are indicative of this increase in complexity. As the society becomes more complicated the instructional work becomes more formal. It is no longer enough to teach skills; something must be done to help the individual members "feel at home" in the culture that is developing. The whole enculturation phase becomes more important. It is in this arena of the evolvement of attitudes and values that some of the great teaching in the Western civilizations has taken place. Highet, for example, says:

> Some of the most important men in history have been teachers. Many of the biggest advances in

> civilization have been the chief work, not of politicians or inventors, not even of artists, but of teachers.[1]

The wide dispersion of formal teaching-learning situations throughout the world is very impressive. When a culture reaches a particular level of sophistication, some type of "school" comes into existence. The continuing development of the culture and that of the "school" are concurrent. According to Bruner:

> The change in the instruction of children in more complex societies is two-fold. First of all, there is knowledge and skill in the culture far in excess of what any one individual knows. And so, increasingly, there develops an economical technique of instructing the young based heavily on telling out of context rather than showing in context. In literate societies the practice becomes institutionalized in the school or the "teacher." Both promote this necessarily abstract way of instructing the young.[2]

Hutchins says, "Any educational system is a reflection of the culture in which it operates."[3] Further, he suggests that in the United States we have come to a point in what he calls the "post-industrial" state where the whole aim of education must change. He contends:

> . . . the frenzy for educational innovation that is sweeping the country suggests that people are becoming aware of the disparity between the drift of society

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[1] Gilbert Highet, The Art of Teaching, New York, 1954, Vintage Books, p. 154.

[2] Jerome S. Bruner, "Culture, Politics, and Pedagogy," Saturday Review, Vol. LI, No. 20, (May 18, 1968), p. 71.

[3] Robert M. Hutchins, "Anatomy of the Post-Industrial Age," The Center Magazine, Vol. II, No. 3, (January 1969), p. 88.

> and aims of education. . . . nobody knows what to do next in education, but everyboy has a vague feeling that it ought to be different from what we have been doing.[1]

If the "past is prologue" as many have suggested, what is indicated for the whole of formal education and for professional educators in this setting? For a number of years there has been a growing recognition of the increased importance of an organized program of instructional improvement that would include thoughtful consideration of the many problems facing the total educational complex. In the light of this recognition, it is appropriate to ask what has actually been done to improve the quality and preparation of those who must make the needed changes in the school program?

Heinich suggests:

> A fundamental cause of system redesign is the development of sufficient energy within a sub-system to force a new analysis-synthesis sequence, resulting in a change in the conceptual framework of the system.[2]

If we can assume that the educational enterprise is a "system," as Heinich does, it is not difficult to pin-point some of the generators of the energy that he refers to. There are many pressures at work upon the formal educational structure in the United States. Increased numbers of students have created serious organizational problems at all levels. Merely housing these people, let alone providing them with appropriate learning materials and experiences, has generated a great amount of concern among both professionals and the lay public. Additional pressure has come from what has come to be known as the "knowledge explosion." While adjustments have had to be made at all levels of the educational structure, this pressure has not been uniform throughout the system. The media field, being closest to the technology that is playing an increasingly important role in education, has received an unusual amount of emphasis. Responsible leaders in the media field have made valiant efforts to respond to this manifest need. To illustrate, early in 1963, the Technological Development Project of the National Education Association published Monograph No. 1 dealing with the definition of terms in the media field. In pointing out a need for a "definition," they said:

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[1] Ibid, p. 88.

[2] Robert Heinich, "The Teacher In An Instructional System," in Media Competencies for Teachers, ed. by Wesley C. Meierhenry, University of Nebraska, Lincoln, Nebraska, 1966, p. 9.

> A satisfactory definition of the field of instructional technology will let us find common ground, will propose tomorrow's horizons, and will allow for a variety of patterns that specific individuals may follow in specific institutions with the single field. Research must be designed in terms of clear understanding of instructional technology. Superintendents of schools are requesting criteria for new personnel needed in the various phases of instructional improvement. Teacher-education institutions need assistance in planning courses for pre-service and in-service

> education that will provide the skills and understanding which will be required in tomorrow's classrooms.[1]

Since that time a number of definitions of instructional technology have been proposed. No one of them is universally understood or accepted. Preparation programs in the media field have proliferated. Again there is no universal agreement or understanding. The programs have a great amount of variance. Some progress has been made, but no final solution has been reached. In the fall of 1968, West wrote:

> A new kind of educational specialist is needed today - but he is not being trained. Urban and rural school systems, government, and industry need well-trained educational media specialists to serve as partners in a growing educational complex.[2]

His implication is that very little has been done relative to the formal preparation of persons to work in the media field. This suggestion is not entirely valid. Over a number of years there have been many man hours and much effort expended in attempting to improve formal preparation programs. Norberg says:

> We in the profession should acknowledge . . . criticism but not be carried away by it to the point

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[1] Donald P. Ely, The Changing Role of the Audiovisual Process in Education: A Definition and a Glossary of Related Terms, Monograph No. 1 of the Technological Development Project of the National Education Association, Special Supplement of A V Communication Review, Vol. 11, No. 1, (January-February 1963), p. 7.

[2] L. Clinton West, "A New Partnership Is Needed!," Audiovisual Instruction, Vol. 13, No. 8, (October 1968), p. 926.

> of professional hari-kari. Competent scholars and investigators as well as informed and wise teachers have been at work in the field for a long time. The viable results of their efforts should not be overlooked or forgotten. What is even more important, their work should be digested, analyzed, and continuously revised, refined, and extended. This is the way a field of inquiry develops and matures. (Italics mine)[1]

Torkelson suggests that a review of the development of teacher audio visual competency can be divided into "three broad time periods." He says, first, a consideration of the historical focus on the beginnings of the movement toward formal recognition of the use of more materials and machines in improving the quality of education. The second period he proposes "may be characterized as the time during which formal attempts were made to spell out the special competencies teachers were expected to possess." He then says that the third period, ". . . encompasses contemporary times marked by research and special emphasis upon teacher preparation for the competencies in question."[2]

One of the first reported courses in the field of "visual education" was taught by Albert Field at the

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[1] Kenneth Norberg, "Theoretical Background Required By Teachers In The Use of Newer Media," in Media Competencies for Teachers, Wesley C. Meierhenry (ed.), University of Nebraska, Lincoln, Nebraska, 1966, p. 43.

[2] Gerald M. Torkelson, "Competencies Needed By Teachers in the Use of Newer Media and Various Approaches to Achieving Them," in Media Competencies for Teachers, Wesley C. Meierhenry (ed.), University of Nebraska, Lincoln, Nebraska, 1966, p. 170-171.

University of Minnesota in 1918. Interest was not high, however, and when Dorris made a study of "visual education" in 1922, she found that only four normal schools offered courses in this area during the regular school term and that two had such an offering in their summer school program. In addition, a few universities and/or colleges offered courses in photography and graphics. By 1936, when Starnes made a similar study, he found "extreme differences in course content, materials used, and the credit offered" when compared with the earlier study.[1]

The growth and development of course work in "visual" and "audio-visual" education has been almost imperceptibly slow. Many of the courses offered have been of the elective variety and not until 1935 was "visual education" considered important enough to be made a state requirement for teacher certification. This requirement was made first in the State of Pennsylvania. In 1937 New Jersey introduced such a course into their four-year teacher education program. California also made an "audiovisual" course a requirement for certification in the mid-forties. Parenthetically, this requirement was later dropped in the State of California.

Under the pressure of the World War II effort, it became apparent that the use of audio-visual materials both speeded up and also improved the quality of training.

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[1] Paul Saettler, loc. cit., pp. 131-135.

Following this, educational leaders became aware of the potential of this medium. This is a classic example of the contention made by Allen that:

> . . . the innovative programs have not been initiated by educators but by individuals and organizations who have seen a need outside the educational establishment.[1]

While it may not be wholly fair to make a blanket indictment it must be acknowledged that a number of recent curriculum developments in the public school realm, such as PSSC physics, BSCS biology, or UISCM mathematics, did not gain their initial impetus from within the ranks of those in public education or in the College of Education of some higher education institution. These programs were initiated at other places in higher education or in industry.[2] Others, both in education and many from outside the profession, have made similar indictments. It must be conceded that this contention has some basis in fact. Educators, either by virtue of their natural bent or as a result of their training and experience tend to be a conservative group. Some allege that the people in the media programs are the most conservative of the whole of education. They make some pointed contentions in relation to program development. For example, Mars asserts:

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[1] William H. Allen, "Audiovisual Instruction: The State of the Art," in The Schools and The Challenge of Innovation, New York, The Committee for Economic Development, 1969, p. 219.

[2] John I. Goodlad, School Curriculum Reform in the United States, The Fund for the Advancement of Education, New York, 1964, p. 11.

> . . . media utilization is not the be-all and end-all of education. . . . Yet, the ego involvement of individuals in audio visual and media programs is tremendous, and unfortunately, the charge of "empire builders" is too frequently well taken. Rarely do we hear of a course being dropped or removed from the catalogue. . . . our programs are simply additive.[1]

This would appear to be a somewhat truncated view of the field of instructional technology, i. e. media and its relation to the overall educational scene. It makes a sweeping generalization that may have some limited validity, but is not wholly valid. Eboch takes a more pragmatic view. He states:

> Audiovisual specialization is but one part of education. It is not all, perhaps not even a major part, of education. The growth of the audiovisual specialization will depend upon the value and effectiveness of specific functions being well performed.[2]

Just what are these specific functions that Eboch alludes to? He goes on to say that there is no generally accepted definition for the job specification and that there is a wide range of thought about what the job description for the "instructional technologist" is or ought to be. To illustrate this divergency, Slack suggests that he, the instructional technologist, is a writer of programs and/or workbooks. He decries the "hard-software

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[1] Walter J. Mars, "Developing Appropriate Media Competencies," The Journal of Teacher Education, Vol. XVII, No. 4, (Winter 1966), p. 430.

[2] Sidney C. Eboch, "The A V Specialist: Some Reflections on An Image," Audiovisual Instruction, Vol. 8, No. 1, (January 1963), pp. 15-17.

(computer programmer) boys" looking at themselves as instructional technologists.[1] On the other hand, Brown suggests that the instructional technologist or "educational media generalist" may need some degree of omnipotence in that he should be (1) a professional resource person, (2) a knowledgeable curriculum worker, (3) an administrator, (4) a professional practitioner, (5) a catalyst for innovation and, (6) an evaluator.[2] These two different points of view may be illustrative of the divergent opinions about the job description. Edling seems to place the entire controversy in better perspective in this statement of the role expectation for the technologist. He says:

> At some point, first among the generalists, and later by formal training, a new specialist appears, one that is knowledgeable not only in a specific enterprise but one who sees the relationships among services performed by others. . . . he advises and guides.
>
> This "new breed" we name "technologists" . . . to indicate the "study" of "applied sciences." (The technologist - the person who studies (at a high level) the application of inventions to social purposes.)[1]

These people, then, are the ones that we are looking for. Where do we find them? Some have suggested that they must come from the behavioral sciences. Others feel that only the exact sciences can provide adequate preparation. Russell suggests that the best source of people for this kind of role assignment may come from education itself. He says that the man we need is:

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[1] Charles W. Slack, "Who is the Educational Technologist?" Educational Technology, Vol. VIII, (July 30, 1968), p. 13.

[2] James W. Brown, "Instructional Materials Services: Why, What, How?" in Report of A Multi-Media Approach To Learning, held in Provo, Utah, January 1967, p. 15-17.

[3] Jack V. Edling, The Contributions of Behavioral Science to Instructional Technology, The Oregon System of Higher Education, Teaching Research Division, Monmouth, Oregon, 1968, p. 1-2.

> . . . one who is at home in two widely disparate fields. One is conventional pedagogy. He will need to know much more about learning, about human development, about the world of education as we know it. On the other side he will need to be sure-footed in the world of advancing science and technology. Computer development, electronic games, new forms of circuitry, the character of DNA and RNA, neurological research - a lot of fields of pure science must also be his preserve, buttressed by skill in the gadgetry that goes with them.[1]

In any event, the leader in instructional technology must have many skills and broad experience to have significant impact upon the educational community.

Competency and Preparation

In a general way, competency has been a major concern for the professional educator over many years. If it can be assumed that the people working in instructional technology are involved in the overall system of education then this concern is also very real for them.

The competency of the educational practitioner is determined in two basic ways. There is the formal determination and also that which is done informally. There is expressed anxiety on the part of a sizeable portion of the personnel in public education about any attempt to formally determine their competency to serve in the public school system. Evaluation of competence, however, is not the concern of this study.

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[1] James E. Russell, Change and Challenge in American Education, Boston, Houghton Mifflin Co., 1965, p. 48.

The people who determine the competency of a professional person are many. The users of his services make a judgment of these services and his qualifications for rendering them. Competency is also judged by the professional person's peers and/or associates. In addition, he will be judged by the community in which he works, whether they are the direct users of his service or not. Those who have administrative assignments in relation to his role will also make an assessment. Finally, those people who have been responsible for his training and education will make a judgment of his skills and abilities. These are all informal types of judgments.

Interest in determining the competency of persons working in the media field is not new. Earlier we have cited instances of studies that have been made in an attempt to determine the kind and extent of formal preparation the potential professional in the media field will or should have. It is interesting to note that over an extended period of time many lists of required competencies and experiences have been drawn up. One of the first formal statements was that of Seaton prepared in 1944 for the American Council on Education. At that time she suggested that two kinds of training were needed in: "(1) operating the projector and (2) effective methods of using visual materials."[1] She went on to suggest that teacher training programs should include utilization of "audio-visual materials and techniques" in methods and subject matter courses. Only higher education institutions that were properly equipped and staffed should offer courses in the training of "audio-visual specialists."[2]

Seaton's suggestions were not the only attempt made to define the preparation programs for teachers with particular reference to audio-visual competency. In the years immediately following World War II interest in this area was high. In 1947, Pascoe was commissioned by the State Department of Education in California to ascertain what competencies were needed by the teachers in the schools in the state. He reported his results where the competencies were divided into a number of sub-areas and then ranked into groups depending upon the way that the various groups of respondents indicated their opinions. The major headings in his listing were (1) knowledges and understandings, and (2) skills and abilities. Under the first heading he included principles of use, selection of materials, types of materials and equipment, sources of materials and equipment, services of audio-visual departments, materials for specialists, production of materials, results of research, single school services, administering of aids, and history of A. V.. Nine subheadings were listed under the second major heading. Included were utilization, selection, evaluation of use, equipment operation, appraisal, display, production, best physical conditions, and field trips. Pascoe indicates that these rankings come from a survey of 253 respondents from the State of California.[1]

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[1] Helen Hardt Seaton, A Measure for Audio-Visual Programs in Schools, American Council on Education, Series II - Motion Pictures in Education, No. 8, Vol. VIII, October, 1944, p. 19.

[2] Ibid, p. 19.

Other listings have been made. The Noel and Leonard study indicated similar results. They, in fact, suggest these same items, as taken from the California Report, as a basis for the evaluation of "teacher education programs in audio-visual education."[2]

The Okoboji Leadership Conference, in 1958, devoted time and effort to dealing with the suggested structure of a teacher education program in relation to instructional materials. The report spells out, in some detail, the entire scope of things the participants felt were necessary for adequate preparation for teaching.[3]

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[1] David Pascoe, "The Pascoe Report," Audiovisual Instruction, Vol. IV, No. 1, (January 1959), p. 6-7.

[2] Elizabeth G. Noel and J. Paul Leonard, Foundations for Teacher Education in Audio-Visual Instruction, American Council on Education Studies, Series II - Motion Pictures in Education, No. 9, Vol. XI, 1947, Washington, p. 2-3.

[3] Summary Report of the Fourth Annual Okoboji Conference Lake Okoboji, Iowa, Summer, 1958, pp. 14-18.

Fulton and White noted many of the other listings and suggested four major classifications for "A V Competencies for Teachers." They are: proficiency in (1) selection and evaluation, (2) the utilization of appropriate instructional materials, (3) the production of simple instructional materials, and (4) the preparation and use of physical facilities.[1]

It is interesting to note that Meierhenry, in 1966, had envisioned the up-dating of these lists of competencies for teachers and that a number of the papers that were commissioned for his report had this as a theme. He says that he found that such an emphasis would not be appropriate:

> Previous lists of competencies had been developed to guide those responsible for the development of pre-service and in-service programs in teacher education. . . It was anticipated by the editor that a new list of competencies would be developed which would eliminate the activities now obsolete and up-date the list which was still current and add some new skills, understandings, and attitudes that the newer media seemed to require . . . At a seminar held in Washington and a small group work conference held in Palo Alto it became clear that the proposed framework was not appropriate.[2]

This kind of statement gives rise to concern on the part of others who would be dealing with the determination of needed competency and experience. It is something that does, nevertheless, need to be considered if one is to make any statement of competency in relation to both teacher education and professionals in the field of instructional technology.

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[1] W. R. Fulton and Fredrick A. White, "What Constitutes Teacher Competence in Audio-Visual Communication?," Phi Delta Kappan, Vol. XXXX, No. 4, (January 1959), p. 158-159.

[2] Wesley C. Meierhenry, Media Competencies for Teachers, University of Nebraska, Lincoln, Nebraska, 1966, p. 1.

What is the purpose of a list of competencies? First, such a listing may be considered as an attempt to establish a written standard against which the persons aspiring to professional status in a given field may be compared. This kind of statement, as Meierhenry has indicated, cannot be a static one. It must be ever-flexing and at the same time stable enough and complete enough that it indicates the overall scope of things that need to be considered. It also has some basic functions that are not noted above. One of these is to protect the users of professional service from the charlatan and/or the incompetent; those who cannot perform at a satisfactory level in line with the expectation of the profession. Further, it does establish a professional level or standard of service that comes essentially from the "within group" pressure to continually improve the quality and quantity of service available.

These reasons indicate that there is a direct relationship between the establishment of competency and the quest for certification that has been one of the goals of the Department of Audio Visual Instruction. Some years ago, the D. A. V. I. adopted the resolution that they would actively promote efforts of state groups to effect certification requirements for audio visual personnel in each of the states. Gains have been made steadily, but not rapidly throughout the several states. It would seem appropriate, therefore, to make some notes of the history of certification and licensing of teachers as it applies to the teaching profession as it has developed in the United States.

Certification

Today, preparation requirements observed by the teacher education institutions and the stipulations for certification of educational personnel made by state agencies denote "hand-in-glove" types of relationships. This level of operation has long been a goal of professional groups working in educational circles. In 1958, for example, the National Commission on Teacher Education and Professional Standards of the National Education Association took the position that,

> . . . more and more emphasis is being placed on the approved-programs approach which allows teacher education institutions to develop, justify, and operate programs of teacher education within the limits of a flexible framework of certification regulations.[1]

The increase in the number of programs of this type attests its increased favor by both the state regulatory bodies and the teacher education institutions.

The picture has not always been this "bright."

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[1] Guy A. Curry, Jr., Assistant Secretary of the National Commission on Teacher Education and Professional Standards, Personal Letter, July 27, 1958.

The history of licensing and certification of professional personnel has been erratic and varied. Budd contends that certification of teachers began because of the "low level of teacher preparation" and a desire, during the "Thirties" to keep "outsiders" from taking the jobs of teachers already in-service.[1]

The licensing and certification of educational personnel is, in fact, much older than Budd implies. These activities began sometime prior to the Revolutionary War. They were largely perfunctory in nature, but did constitute a beginning. Many of the first attempts were based upon moral and ethical considerations, or political loyalty, rather than upon any academic qualifications. Most of the "certification" was done by individuals or groups with a religious objective. Givens and Farley indicate that:

> The qualifications of the personnel serving in the earliest colonial schools was dictated by their predominantly religious objective. The Minister, or someone selected by him as a teacher on the basis of his adherence to the appropriate creed, and a supervising school committee of members chosen by the church made up the teaching and governing bodies of the local . . . school.[2]

During the years that passed from the time of the Revolution to the Civil War, very little progress was made in the realm of teacher certification. Reports of various studies made recommendations, a number of plans were proposed and tried in some places, but at the outbreak of the Civil War no state had an effective licensing program for teachers. At the close of the Civil War, however, public pressure demanded that some further work be done in regard to the establishment of minimum requirements for many areas of professional endeavor. The teacher, and education in general, were caught in this forward move and many changes were wrought in the "hit or miss" program that had characterized teacher preparation and certification prior to the War.[1]

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[1] William C. Budd, "Certainty in Certification," Phi Delta Kappan, Vol. XXXX, No. 5, (February 1959), p. 209.

[2] Willard E. Givens and Belmont Farley, Our Public Schools, The Supreme Council 33°, Ancient and Accepted Scottish Rite of Free Masonry, Southern Jurisdiction, U. S. A., 1959, Washington, D. C., p. 41.

Following this breakthrough progress was slow. From requiring a high school diploma for certification through the six-week summer school to the two-year normal school certificate took many years. Finally full certification required a four-year college preparation terminating in a bachelor's degree for teachers of both elementary and secondary school students. While this was not a requirement in all states, it was during the depressions of the Twenties and Thirties that this goal was achieved in a significant number of the states. It was at this time, as noted above, that there were more teachers than teaching positions and certification was one way of holding the positions for those who met formal requirements.

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[1] Harry J. Carman, "The Historical Development of Licensing for the Professions," The Educational Record, Vol. 39, No. 3, (July 1958), pp. 268-278.

The impact of World War II upon education in the United States was multi-faceted. One of these facets was the re-creation of a shortage of teachers and the subsequent issuing of "temporary" and sub-standard certification. This problem has continued to the present day. The professional groups, however, have gained more strength and have successfully worked for higher standards of certification for all teaching personnel. Campbell notes that, "in 1964-65 more than 90 percent of public school teachers had bachelor's degrees and that 24 percent held master's."[1]

Why should a group of media generalists seek certification? Carmen cites two reasons that may be factors that any association should consider in making this move to seek recognition. He says:

> First, (is) the opportunity afforded to raise ethical standards: . . . Second, membership in an association is a means of raising one's status in the community and enlarging one's compensation.[2]

Both of these reasons, coupled with a number that are implied from earlier discussion, are worthy of consideration for persons in the "education profession."

The view that certification will solve many of our problems related to the determination of competency is not universally shared. Buehler questions the premise and says, "Since we in education have not and cannot come to grips with what constitutes competency in our field, we rely on artificial barriers - among them, certification."[1]

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[1] Roald Campbell, "Teaching and Teachers - Today and Tomorrow," in The Schools and the Challenge of Innovation, Committee for Economic Development, New York, 1969, p. 113.

[2] Carmen, loc. cit. p. 177.

Recent Studies

There have been many different approaches to the study and proposed improvement of the preparation programs for the persons interested in instructional technology. The Department of Audio Visual Instruction, for example, has appointed both committees and commissions to assist in the study and development of these programs. The American Association of Colleges of Teacher Education has selected a special committee to study the relationship of teacher education and media. A number of private foundations and governmental agencies have made funds available to support a variety of research projects in this field. Universities and individuals have committed both time and funds to the improvement of preparation programs.

An example of the current interest is the federally-funded "Jobs in Instructional Media Study" being conducted by a special task force from the Department of Audio Visual Instruction. "The particular focus of this project is jobs in the instructional media field which are usually dubbed 'subprofessional' or 'para-professional.'"[1] A similar study being conducted in Oregon is designed to, "develop and validate criteria for evaluating media training."[2] It also is federally-funded. These studies are among the most recent of a long series of formal efforts in developing more fundamental knowledge of the basic needs of those preparing to work in the field of instructional technology.

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[1] Ronald G. Buehler, "Competency: Yes, Certification: No," Audiovisual Instruction, Vol. 10, No. 10, (December 1965), p. 766.

Other examples of work that has been done in this area can be found in the reports of the Lake Okoboji Educational Media Leadership Conferences. The report of the 1958 Conference states:

> . . . we have given little attention to deciding what levels of audio visual competency are desirable and/or essential in our efforts in teacher education. There exist numerous lists or statements, in course outlines, texts, and other places, of the kinds of competencies which teachers should possess; but with little or no agreement on even suggested standards with respect to degree or level of competency in evidence.[2]

The Conference participants worked at developing guidelines for the inclusion of media skills and knowledges in teacher education and suggested,

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[1] Jim Wallington, Pryor Hale, and Freda Douglas, "Toward Solving the Media Manpower Puzzle," Audiovisual Instruction, Vol. 14, No. 1, (January 1967), p. 36.

[2] Dale G. Hamreus, Progress Report, Project No. 8-0520 - Development and Validation of Criteria for Evaluating Media Training, May 1969.

[3] Summary Report of the Fourth Annual Okoboji Conference, Lake Okoboji, Iowa, Summer, 1958, p. 9.

What Every Teacher Should Know About the Use of A-V:

. . . knowledge of what "good A-V" is and how to implement the curriculum with this knowledge

. . . a working knowledge of a wide variety of instructional materials

. . . knowledge of where to locate and how to obtain the various instructional materials needed for a specific teaching situation

. . . relationship between A-V and the learning process

. . . a better overall view of the curriculum and knowledge of how they and A-V fit into the program.[1]

Subsequent sessions of the Okobiji Conference have worked around the theme of preparation for the professional in the field. Harcelroad, at the Seventh Conference in 1961 proposed "a list of areas of knowledge essential for AVC Specialists." He presented these items for consideration:

Content and materials (known in ways the content specialist may not know these)

Principles of learning, in depth

Technological developments and what they can do for teaching and learning

Statistical skills (for evaluation functions)

Principles of arranging subject matter for effective teaching

The process for the creation of materials, capacity to supervise their preparation

Capacity to help teachers "program" their own teaching[2]

Following this presentation, the conferees proposed a four level professional preparation program beginning with a Bachelor's degree and including both a Master's and Specialist's level in preparation programs. The fourth step was at the Doctoral level. Attention was also given to the description of a variety of job assignments in the media field as they related to differences in preparation expectations.

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[1] Ibid, p. 12.

[2] Summary Report of the Seventh Okoboji Leadership Conference, Lake Okoboji, Iowa, Summer 1961, p. 9.

At the 1965 Okoboji Conference, the Committee on Manpower suggested two professional classifications that were included in a "Master's level or higher" program. In the "Sixth year or higher" program, they proposed the placing of those job assignments such as, "Audiovisual Director or Instructional Resources Director, Curriculum Materials Supervisor or Educational Media Director, and Professor of Education" under the general heading of "Professional Direction, Supervision, and Teaching." The more specialized designations such as Graphic Supervisor, Computer Programmer, T V Director and Cinematographer were placed under the heading of "Professional Specialization at the Master's level or higher."[1]

The provisions of Title VII of the National Defense Education Act provided funds for a number of studies of various phases of education. Examples of those that have particular reference to the media field are the STEMS (Seminars on Training of Education Media Specialists) study reported by Hall, the Study of Regional Instructional

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[1] Summary Report of the Eleventh Okoboji Leadership Conference, Lake Okoboji, Iowa, Summer 1965, p. 44.

Media Resources: Phase I - Manpower done by Martin, and the Media Competency for Teachers study completed by Meierhenry. All are comparatively recent, the first two being completed in 1964 and 1965 respectively, and the Meierhenry study in 1966.

Foundation supported studies have made reference to the role of media in education. Some of the first of these were those done for the American Council on Education done by Seaton and by Noel and Leonard in the 1940's. The Rockefeller Fund and the Ford Foundation both have supported programs dealing with an overall study of education. Ford, particularly, has spent large amounts of money on projects dealing with the instructional use of television.

Many unpublished and individual studies have dealt with the training and preparation and competency development of both teachers and the professional level people in the field of instructional technology. Illustrative of these are deKeiffer's study of "The Status of Teacher-training in Audio-Visual Education in the Forty-eight States;"[1] Ely's study of "The Organization and Development of Communications Programs in Selected

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[1] Robert Eulette deKeiffer, "The Status of Teacher-training in Audio-Visual Education in the Forty-eight States." Unpublished doctoral dissertation, State University of Iowa, 1948.

Institutions of Higher Education;"[1] Wiman's study of "An Interdisciplinary Approach to Planning a Program of Professional Preparation for Media Specialists;"[2] and McMahan's study of ". . . the Feasibility of a System of Pre-Service Education in Media."[3]

Summary

The story of man's progress is replete with accounts of his interest in helping his progeny to grow and develop. As society becomes more complex he relies increasingly upon formal educational experience to supplement the home and family as a primary source of instruction. The development of organized instructional systems is dependent upon the social order that conceives it. Changes in these systems are likewise functions of changes in the needs of the society.

The development of instructional technology has been slow and somewhat erratic. Various pressures have both encouraged and blocked the extension of the use of instructional materials and the supporting educational and/or training programs. The expansion of programs for the formal training of professional level personnel has likewise been inconsistent. Some have contended that this is the result of a "natural conservatism" on the part of professional educators. It must be acknowledged that a number of the innovations in the instructional program have come from outside the ranks of professional education. Noteworthy examples of this are the experiences of the military training programs during World War II and more recently the structured curricular innovations such as PSSC physics, BSCS biology, UICSM mathematics, and similar projects.

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[1] Donald Paul Ely, "The Organization and Development of Communications Programs in Selected Institutions of Higher Education." Unpublished doctoral dissertation, Syracuse University, 1960.

[2] Raymond Victor Wiman, Jr., "An Investigation of Factors Relating to an Interdisciplinary Approach to the Development of Training Programs for Educational Media Specialists." Unpublished doctoral dissertation, University of Nebraska, 1963.

[3] Marie E. McMahan, "A Study of the Feasibility of a System of Pre-Service Teacher Education in Media." Unpublished doctoral dissertation, Michigan State University, 1968.

Competency of professional personnel has long been a concern of the whole of formal education. With the increased emphasis upon technology in instruction, this concern has been magnified for those who are involved in instructional technology. Over a period of years, studies have been made and projects launched to develop and evaluate programs that would improve the training of teachers and other educational personnel to insure maximum competency. Closely related to program improvement has been the evolvement of state certification requirements for professional media personnel. The effectiveness of the certification standard as an approach to the determination of competency has been the subject of some controversy and debate.

The support of the federal government and interest of various foundations has made it possible to conduct a number of studies of the preparation programs for professional personnel in the field of media. These projects supplement those that have already been done by both universities and individuals in higher education. Each one has made a contribution to the growing knowledge about the role of instructional materials and trained people in the improvement of the whole of education. It should not be implied, however, that there has been a final conclusion in any of these reports as to what the optimum kind of program is. One of the things that has been found is that there is not a static list of courses and/or experiences that can be looked upon as the single "best" preparation for the professional level person in this field.

This study is designed to obtain some insight into the most favorable experiences, their interplay, and their influence upon competency development.

CHAPTER III

DESIGN FOR THE STUDY

The material presented in this Chapter will be divided into three different sections. Each of these sections will be used to describe one of the principal sources of data and the treatment that it has received in the study. These sources of information are:

(1) Preparation programs; as described in catalogs, brochures, and related materials; for doctoral level people in the field of Instructional Technology at each of the five institutions that comprise the University Consortium on Educational Media and Technology.*

(2) "Field Perceptions" obtained from the students and the graduates of the existing preparation programs at each of the institutions cited above. Students and graduates were polled by means of a mailed questionnaire. In addition, teaching and

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*The five institutions that make up the University Consortium on Educational Media and Technology are: The University of Southern California at Los Angeles, Indiana University at Bloomington, Indiana, Michigan State University at East Lansing, Michigan, The Oregon System of Higher Education - Teaching Research Division at Monmouth, Oregon, and Syracuse University at Syracuse, New York.

administrative staff at each of the institutions were asked to respond to a questionnaire.

(3) Suggestions and/or "promptings" from those identified by the academicians as scholars, innovators or philosophers were taken from writings and speeches. Both current literature and audio tapes were used as sources of this information.

Preparation Programs

The first step in determining the scope of the formal preparation programs at each of the institutions was to examine the general catalog for each one of them. It was determined that all of the universities have the program for Instructional Technology included in the Colleges of Education. More detailed study was then made of the requirements within the graduate program of the College of Education.

In order to obtain current information, requests were sent to each university requesting a copy of the bulletins for the College of Education and also for the Graduate School. Brochures and other promotional materials that might give more detail as to the admission requirements, course offerings, and course requirements were also requested. Syllabi and "handout" materials for students were solicited.

The request for catalogs and related promotional materials was promptly acknowledged and these materials were received from each of the institutions. Other materials, i. e. class outlines and "hand-outs", were more difficult to obtain. Three of the universities did send samples of this kind of information, however. A fourth institution neither acknowledged the request or sent any materials. Information about the program at this institution was obtained from the library and other sources.

It was determined that in the Oregon System of Higher Education it was not possible to obtain a doctor's degree with a major in the field of Instructional Technology at this time. Consequently, information from the Oregon System has not been included in this portion of the study.

The information gleaned from the general catalogs was supplemented by that obtained from the specific College of Education listing and the descriptions of courses found in the College catalogs and special promotional brochures describing the program in Instructional Technology. More complete information was obtained from the course syllabi and the student "handouts." In these materials, the course objectives were frequently stated in behavioral terms and this made the information more meaningful in terms of the experiences and competencies that might be included within the content of the course. The scope of the course was then easier to assess.

Current literature also contributed to this phase of the data collection. A number of people serving on the

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instructional or administrative staff at the universities included in the study have written articles for current periodicals dealing with their programs and some of the proposed changes that are still in the planning stages.[1,2]

Field Perceptions

"Field Perceptions" were obtained from people working in the field. The response to a written questionnaire was used to determine their opinions and recommendations.

Population and Sample

The population selected for this portion of the study was two-fold. The first group was the student/graduate group from each of the four institutions included in the study. The second aggregation consisted of the teaching and administrative staff from all of the institutions.

Letters were sent to administrative personnel in the Departments of Instructional Technology at each of the universities that comprise the Consortium requesting listings of the names and addresses of students currently enrolled in the doctoral level program. The same information was also solicited for people who had completed the

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[1] L. C. Larson, "Developing a Graduate Program to Train Instructional Design and Media Specialists," Audiovisual Instruction, Vol. 14, No. 1, (January 1969), pp. 20-24.

[2] Donald P. Ely, "Consortium in Educational Media and Technology," Educational Technology, (January 1969), p. 33.

requirements for the doctor's degree, with a major in Instructional Technology and were currently working in the field. Follow-up telephone calls were necessary in two instances, but listings were obtained from each of the schools.

The lists received did not discriminate clearly between the people who had finished the degree requirements and those who were still enrolled in the program. In order to prevent bias introduced by trying to make an arbitrary distinction between the two sub-groups the decision was made to take a random sample from each of the lists. No attempt was made to sub-divide the lists into two parts. This decision was aided by the fact that the size of the lists varied from fifty to two hundred. It was felt that it would be more meaningful to determine the perceptions of similar size groups rather than attempt to obtain interpretable information from the disproportionate number balance. Accordingly, the lists were numbered and a sample of thirty-five names was drawn from each list using the Table of Random Numbers.

Instrumentation

The instrument used to assess "field perceptions" was a written questionnaire. It was prepared following perusal of the programs operating in each of the institutions involved in the study. Items suggested from this evaluation were included in the questionnaire. An extensive review of the literature suggested other items that were added to the form. Additional factors were suggested by members of the Advisory Committee. Advice from fellow students and Advisory Committee also resulted in some changes in the format of the questionnaire form. The form was divided into two parts. The first dealt with requirements for admission to the doctoral level program. The second portion listed course titles and/or experiences that were thought to be pertinent. Following each suggested item was space for "Comment" to permit the respondent to react in an open-ended statement if he wished to do so. A larger space was provided at the end of each section of the questionnaire and also at the conclusion of the form.

The original version of the questionnaire was given to five doctoral level students at Michigan State University as a pilot run. Their responses, reactions, and suggestions prompted some additional alterations in the form and content of the questionnaire prior to submitting it to the total sample of students and staff members. Specifically, the method of registering the response was changed to encourage more complete response and greater accuracy in interpreting the response made.

Distribution

Questionnaires were sent to one hundred-forty students and graduates from the four institutions. They were also distributed to a total of twenty staff members from all the universities. The same form of the questionnaire was used in both cases. The cover letter was different. Samples of both the questionnaire and the cover letters are included in Appendix A.

Treatment

The data obtained from the questionnaire were of two types, one consisting of scaled responses to suggested items; the other was composed of comments and suggestions made by respondents. The direct responses to the items suggested on the form were treated statistically. The basic treatment was a One-Way Analysis of Variance for each of the items. To make this feasible, the ANOVAR program for the IBM 360 - Model 50 Computer was used. This gave an F-test of significance for each item from the questionnaire and also determined a "grand mean value" for each of the items. To give more sensitive indications of the significance of the response pattern among the five groups the Newman-Keuls Sequential Range Test and Kendall's Coefficient of Concordance were also applied to the data. The Newman-Keuls Test is a form of "post hoc comparison" that is used to pin-point the sources of difference when the One-Way Analysis of Variance shows a significant difference in the response patterns. The Kendall's Concordance Test indicates the extent of the agreement among the different groups. These treatments were used to determine if (1) there was consensus as to which of the suggested items were "most important;" (2) if the different groups made similar or divergent responses to the items on the questionnaire; and (3) if there was consensus between the students and the teaching staff as to the relative importance of the suggested items.

Comments and statements related to the suggested items were not included in the statistical treatment. Most of these were in the form of either direct statements or questions. It appeared appropriate to discuss them in the general presentation of the findings of the study. The overall comments and suggestions have been noted in the general discussion.

Recommendations from Scholars, Innovators, and "Philosophers"

Much has been said and written about the preparation of professional personnel in all of education. Instructional Technology has not been ignored in all of this material. Rather, it would appear that recently the field may have moved into a more prominent position. Many of the suggestions and "promptings" from those who have studied and indicated a position or positions are available in both written and other media forms. The data secured for this section of the study were obtained from written and audio sources.

A comprehensive review of the literature was made.

Book, pamphlet, report, and periodical sources were surveyed. Special reports of conferences and seminars were available and included in the survey. Some of these were in written form; others were obtained in the form of audio recordings.

There was also limited opportunity to interview leaders in the field. These were made in face-to-face discussions and by telephone consultations. In addition, persons who are preparing special reports in this area that have not yet been released for publication, were gracious enough to make "progress reports" available.

Summary

Data for the study have been obtained from three principal sources. They are (1) a survey of the preparation programs for doctoral level people at the higher education institutions that make up the University Consortium in Educational Media and Technology, (2) responses to a questionnaire submitted to students, graduates, and staff working in the field of Instructional Technology at these institutions, and (3) the suggestions and/or "urging" of scholars, innovators, or "philosophers" in relation to the present situation and their projections for the future.

The programs from each of the universities was surveyed through the use of the General Catalog, the catalog for the College of Education, brochures and other promotional materials, syllabi for the various courses, and student "hand-outs." Specific attention was given to admission policies, to course offerings and course requirements, and the time involvement in the degree program.

The questionnaire responses were treated statistically with a One-Way Analysis of Variance test of each item to determine reliability, consensus or lack of consensus and the "most important" variables in the perception of students, graduates, and staff at the schools included in the study. Additional statistical tests were used to check and verify the results of the ANOVAR computation.

Information secured from writings and speeches relative to teacher education generally and media specifically has been included in the discussion. Hopefully this kind of "tempering" will make the overall study more meaningful and useful.

CHAPTER IV

ANALYSIS OF RESULTS

The information presented in this chapter follows the pattern outlined in Chapter III. The first section will give an analysis of the programs at four institutions that prepare doctoral level people that also are members of the University Consortium in Educational Media and Technology.* The second section will report the statistical analysis of the findings of the questionnaire study of "field perceptions" of persons actively working in the field of instructional technology as students or members of the teaching - administrative staff at these institutions. The final section will give the information obtained from current literature and from conference reports plus some personal interview data and material from addresses and unpublished materials.

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*The five institutions that make up the University Consortium on Educational Media and Technology are: The University of Southern California at Los Angeles; Indiana University at Bloomington, Indiana; Michigan State University at East Lansing, Michigan; and Syracuse University at Syracuse, New York. The Oregon System of Higher Education - Teaching Research Division does not conduct a doctoral level program in Instructional Technology. See page 60.

Background Information

In beginning an assessment of each of the four institutions it was determined through the study of the general catalog from each school that the graduate program that included instructional technology was, in each instance, a department or sub-department within the College of Education. Consequently, the College or School of Education bulletins were used for more detailed study and analysis.

Two different doctoral degrees are awarded by each University. The degree of Doctor of Philosophy is administered as a joint responsibility of the College of Education and the Graduate School. Ostensibly this is a more research-oriented degree. At the schools included in this study, however, it was determined that the major difference between this degree and the Doctor of Education degree was the foreign language requirement. For example, the bulletin of the University of Southern California states:

> In accordance with established policy, the Ph.D. Candidate must have a minimum reading knowledge of two languages. When the student demonstrates reading knowledge of one language above the minimum level, and on the recommendation of the student's Guidance Committee, a formally demonstrated knowledge of advanced statistics may be substituted for the foreign language.[1]

A similar standard is in force at each of the other institutions. Syracuse University does, however, qualify their requirement, ". . . mastery of a foreign language is one of the options that may be designated by the department concerned, but it may be chosen by the candidate only where it is shown to be a useful research tool."[1]

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[1] Bulletin of the University of Southern California School of Education, 1968-1970, Vol. 64, No. 4, p. 60n.

The work for the Doctor of Education degree is administered through the graduate office of the School or College of Education. The requirements for this degree do not vary appreciably from those for the degree of Doctor of Philosophy. The title of the degree does not indicate any significant difference between the two classes of degrees awarded at the institutions included in this study.

The Oregon System of Higher Education is composed of Oregon State University at Corvallis; the University of Oregon at Eugene; Portland State University at Portland; The Oregon College of Education at Monmouth; Southern Oregon College at Ashland; Eastern Oregon College at LaGrande; and Oregon Technical College at Klamath Falls. At the present time none of these higher institutions offer a program that would enable a student to obtain a doctor's degree with a major in instructional technology. Consequently, their requirements and program offerings are not included in this report.

Admissions Requirements

Requirements for admission to the graduate program as "degree-seeking" or "matriculated" students at the doctoral level are similar for all of the institutions included in the study. It is assumed that all candidates have received the baccalaureate degree. A master's degree is not required at all of the institutions, but is strongly recommended at both the University of Southern California and Michigan State University. No mention of a Master's degree as a prerequisite is made by either Indiana or Syracuse Universities.

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[1] School of Education, A Syracuse University Bulletin, Vol. XCII, No. 7, September 1968, p. 19.

Teaching Experience

Some practical experience is recommended by all of the institutions included in the study. At the University of Southern California the requirement is very specific and asks for "two years of teaching or equivalent experience."[1] No specific mention of experience for doctoral degree candidates is mentioned in the Syracuse University catalog. For their "Certificate of Advanced Studies," however, one of the requirements is "satisfactory completion of at least two years of employment in the field of specialization."[2] Indiana University qualifies their requirement for experience by indicating, "Students preparing to use audio-visual materials other than in public school work do not have to hold a teacher's certificate or meet the admissions requirement of 10 hours of education."[1] Michigan State University makes no mention of teaching experience in their graduate catalog. In a brochure describing the graduate program in Instructional Development and Technology at Michigan State, however, this observation is made:

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[1] Bulletin of the University of Southern California, 1969-1970, School of Education, Vol. 64, No. 4, September 1968, p. 61.

[2] School of Education, A Syracuse University Bulletin, Vol. XCVII, No. 7, September 1968, p. 18.

> Teaching or administrative experience is not a prerequisite to admission. However in the students program, it would be necessary to compensate for its absence by emphasizing appropriate internships or clinical experiences.[2]

Grade Point Average

Each of the universities has indicated a minimum acceptable grade point average for work completed prior to application for admission to the doctoral program. Though some of these are not clearly stated in the graduate or general catalog, brochures describing particular programs are very specific. Indiana University, as an example, does not have a clear statement in the general catalog. One of their brochures describing a specific program in Instructional Development, indicates a minimum acceptable grade point average of "2.5 (where 2.=C)."[3] Michigan State University suggests that "(a) significant factors in determining ultimate acceptance as a candidate are . . . a grade point average of at least 3.0 (B) in the last two years of undergraduate work and/or 3.0 (B) at the M. A level."[1] The catalog from Southern California specifies "a scholastic average of 3.00 (B) in all graduate work in which grades are assigned."[2] Syracuse University indicates that a "3.25 or equivalent" average is necessary.[3]

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[1] School of Education, Graduate Division, Indiana University Bulletin 1969/70, January 30, 1969, p. 27.

[2] Michigan State University, College of Education, Professional Programs in Instructional Development and Technology, 1968-69.

[3] Indiana University Audio Visual Center, An Institute for Training Instructional Developers for Higher Education, p. 3

Examinations

Different levels or kinds of preliminary examinations are prescribed by the four universities. The Graduate Record Examination is the most common. Both Aptitude and Area sections of this examination are requested at Michigan State University, the University of Southern California, and Syracuse University. Only the Aptitude section is required at Indiana University. The results of the Miller Analogies Test are prescribed at Syracuse University and are listed as an option for the Graduate Record Examination at Michigan State University.

Personal Interview

Personal interview or evaluation is indicated as a basic requirement at both Syracuse University and the University of Southern California. Though personal interview is recommended at Indiana University and at Michigan State University, it is not a rigid pre-admission requirement.

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[1] Michigan State University, College of Education, Professional Programs in Instructional Development and Technology, 1968-69, p. 5.

[2] University of Southern California Bulletin, 1968-1970, School of Education, Vol. 64, No. 4, September 1968, p. 61.

[3] School of Education, A Syracuse University Bulletin, Vol. XCVII, No. 7, September 1968, p. 18.

It is apparently assumed at all of these institutions that full admission to the doctoral program will have been preceded by some time spent in residence. Though the catalogs do not specifically state that some residence credit must be obtained before formal admission, it is strongly implied by the outline of procedural steps for admittance to the doctoral level programs.

Summary

Admissions requirements at the four institutions included in the study are very similar. There is no major variation in any one of them. Differences would be in degree rather than kind.

All require a bachelor's degree and a grade point average in previous work ranging from 2.5 through 3.25 on a four-point scale. All require some preliminary examination, preferably the Graduate Record Examination and/or the Miller Analogies Test. The requirement of previous teaching experience, however, is not universal. It is encouraged by all of the institutions. Another requirement that is not universal is the personal interview prior to admission. Two schools require it, and the other two recommend it.

The specifications for admission to the doctoral program at the four institutions are almost identical. For a tabular presentation of this information see Table I.

Course Offering

The number and variety of courses offered in instructional technology by the four universities are salient. Course titles and catalog descriptions are not as indicative of true course content as one would hope they would be, but do serve to give an idea of the total picture of experiences and competencies considered to be important by the institution under study. The course syllabi and handout materials give a more meaningful indication of the course content. The similarity of total offering is noteworthy.

Each of the institutions offers an introductory course in media at the graduate level. As might be expected, the composition of this course varies with the school and the instructor. This is true also for the other courses listed in the catalogs, though it may not be quite as apparent in other courses. The catalog description of the introductory course at Michigan State University, for example, places emphasis upon utilization of media in instruction. The catalog description cites work in "learning principles; nature and application of films, filmstrips, slides, . . . radio and television and equipment operation . . . includes evaluation and

TABLE I

LISTING OF REQUIREMENTS AND RECOMMENDATIONS FOR ADMISSION TO DOCTORAL PROGRAM

UNIVERSITY	Bachelor's Degree	Master's Degree	Teaching Experience	Graduate Record or	Miller Analogies	G. P. A.[1]	Interview
University of Southern Calif.	R	R	R	R		3.00	R
Syracuse	R	S	R	S	R	3.25	R
Indiana	R	S	S*	R		2.50	S
Michigan State University	R	S	S	R	R**	3.00	S

S = Suggested but not a requirement

R = A basic requirement

*Indiana qualifies this requirement if the applicant does not plan to work in the public schools

**The Miller Analogies Test may be substituted for the Graduate Record Examination, but the G. R. E. is preferred

[1] The G. P. A. (Grade Point Average) indicated assumes a Four Point Scale, i. e. A = 4.00, B = 3.00, C = 2.00

selection of pertinent materials."[1] To contrast, the introductory course at Syracuse includes "definition and development of the field, impact of technology on educational institutions; characteristics of media; objective specification evaluation of instructional modules and systems."[2] The introductory course at the University of Southern California is classroom oriented. The title of the course is "Classroom Use of Instructional Media." The catalog description indicates that the emphasis is upon "methods of selection, evaluation and utilization of instructional media integrated with curricular content."[3] The lowest numbered graduate course at Indiana University is titled, "Workshop in Audio-Visual Communication," and appears to be directed toward selection and utilization of commercial materials and equipment and the production of comparatively simple teacher-made materials. The beginning, or foundation course in the doctoral program is entitled "Survey of Audio-Visual Communication," and, according to the syllabus, "emphasizes the relation of audience analysis to effectiveness of communication in formal and informal education."[1]

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[1] Description of Courses and Academic Programs for Graduate Study - 1969, Michigan State University, Vol. 63, No. 8, December 1968, p. 395.

[2] School of Education Course Listing, A Syracuse University Bulletin, Vol. XCVII, No. 7, September 1, 1968, p. 17.

[3] Bulletin of the University of Southern California School of Education, 1968-1970, Vol. 64, No. 4, p. 94.

As the outlines for the other courses are studied, contrasts become less obvious. To illustrate, the beginning programmed instruction course at all of the institutions deals with the theory and technique of programming, and evaluation of commercially produced materials and machine orientation. Similar examples can be found in "tool-oriented" courses such as still photography, graphics, motion picture production, and instructional television.

The scope and breadth of the course structure varies from school to school. Both the inter-departmental approach and the "self-contained" approach to course offerings are used. At Michigan State University the inter-departmental approach shows the "Radio and Television in Education" course as an offering in the College of Communication Arts in the Television and Radio Department. At Indiana University the radio and television course, with a similar catalog description, entitled "Radio and Television," appears in the listing of the Audio-Visual Communication Department. At Syracuse University the "Instructional Television Workshop" and the elementary course in Instructional Television are included in the Instructional Technology course listing. At the University of Southern California the course titled

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[1] Indiana University, Syllabus for R546, Survey of Audio-Visual Communications, 1968.

"Educational Uses of Television" is listed in the Department of Instructional Technology.

It would appear that when the University has some particular strength outside the Instructional Technology Department that this expertise has been utilized. An example from Michigan State University has been cited above. Another illustration of this type of operation is the motion picture course, Cinema 530a, at the University of Southern California. This course is offered through the Division of Cinema in the School of Performing Arts. Inter-departmental cooperation of this kind has great potential for increasing the strength and also the scope of the doctoral program. This is the basis for the contention of Wiman that some schools not now offering a doctoral program can participate in a graduate level program only if they utilize many of the different departments around the university.[1] His proposal selects five "broad areas" of emphasis, "psychology, education, cultural studies, design, and library science."[2] All are integral parts of the preparation program for the instructional technologist.

It would seem reasonable to indicate that an interdisciplinary approach might also include areas more closely related to instructional technology. Specifically, the areas of radio and television, computer technology and its use in instructional frameworks (as administered by engineering schools), and the whole area of communications theory and practice could well be included. This would permit specific reference to the theory aspects of these three supporting fields and would increase the viability of the total course offering in the preparation program.

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[1] Raymond V. Wiman, "An Interdisciplinary Approach to Planning a Program of Professional Preparation for Media Specialists," Audiovisual Instruction, Vol. 12, No. 2, (February 1967), p. 110-113.

[2] Ibid, p. 112

Some phases of similarity have been noted. It should not be assumed, however, that this agreement negates the differences that do appear in the programs. The University of Southern California, for example, would appear to be more "theory-oriented" than is Michigan State University or Indiana University. Michigan State University has a particular strength in the area of instructional development. Indiana University is recognized for expertise in the area of production of media materials. Syracuse University seems to have, at this time, one of the most well-rounded programs. They offer both the production courses and the theory courses. This may be the result of a recent re-designing of part of their program. Indiana University is in the throes of a complete evaluation and re-designation of their course work. They have introduced at least twenty-four new experimental courses into the offering during this last academic year (1968-69) and are awaiting approval of the Curriculum Committees of the Graduate Division of the School of Education and the Graduate

School before assigning them a permanent status.[1] Some of the typical titles of the courses offered are: Advanced Systems and Computer Applications, Cognitive Processes and Media Variables, Internship in Instructional Synthesis, and Seminar in Diffusion and Adoption.

A faculty-student committee is currently at work at Michigan State University charged with the establishment of guidelines for changes in the advanced graduate level program in Instructional Development and Technology. General headings of the items under consideration include philosophy, systems, psychology, communication, instructional technology, administration, political-social-economic theory, and general education. No new courses have been added to the curriculum as yet. It is possible, however, to make experimental additions to the course offering, as was indicated at Indiana University.

As noted above, course titles and catalog descriptions do not always give an accurate or comprehensive indication of either course content or the methodology of teaching. Recognizing this, the syllabi and student handouts for a number of courses were carefully studied. This study showed that there is similarity across the programs at the four schools though specific courses are difficult to relate directly.

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[1] Focus, sponsored by the Student Audiovisual Association and Audio-Visual Center, Indiana University, Vol. 3, No. 1, (April 1969), p. 8.

It was found that certain competencies may be the goal of a course with a particular number and title at one university, and may also be the primary goal of a similar course at one of the other schools, but with an entirely different course title and catalog description. The "Production Techniques" at Indiana University has essentially the same goals and objectives as the "Still Photography in Education Course" at Syracuse University or the "Photography in Instruction" course at Michigan State University. The converse was also found. The "Workshop in Instructional Technology" at Syracuse University emphasizes "current development in and directions of instructional technology; emphasis on changing philosophies and new media developments."[1] The "Workshop in Audio-Visual Communications" at Indiana University deals with "utilization preparation, and administration of audio-visual materials."[2] The same kind of discrepancy in course title, number, and catalog descriptions can be found in a number of other areas. At the same time, as was noted earlier, the descriptions for a course such as programmed instruction are almost identical. Many of the seminar type courses reveal common objectives. An example of this is the "Research and Development in Educational Media" seminar at Michigan State

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[1] School of Education Course Listings, A Syracuse University Bulletin, Vol. XCVII, No. 7, (September 1, 1968), p. 18.

[2] School of Education, Graduate Division, Indiana University Bulletin, 1969/70, (January 30, 1969), p. 62.

University and the seminar dealing with "Critique of Research in Instructional Technology" at the University of Southern California. Provisions for field work or internship are made by all of the institutions under similar titles. Individual study is mentioned specifically in both the Michigan State University and University of Southern California catalogs and is implied at Syracuse University and Indiana University, again in analogous terms.

Close study of the catalog description, assorted course syllabi, handouts to students, and personal interview indicates that there is much similarity in the "basic" competencies and experiences that are made available to the advanced graduate student. They also show that there is some inequality in the breadth of the program included within the Department of Instructional Technology. This inequality is partially counterbalanced by interdepartmental arrangements at some of the universities. It is apparent that the status of the Department within the institutional framework varies from university to university. To make a judgment relative to the strengths and/or weaknesses of a particular type of organizational structure would be both presumptious and fallacious for a study of this nature.

Field Perceptions

Distribution and Return of Questionnaire

Questionnaires were sent to 152 persons affiliated as students, graduates, and staff members with four of the five institutions that comprise the University Consortium in Educational Media and Technology.

Returns were received from 67 percent of those to whom the instrument was sent. The range of response varied from a 49 percent return from the student-graduate group affiliated with Syracuse University through an 88 percent return from the Michigan State University group. 81 percent of the staff members to whom the questionnaire was sent returned a usable response. Only four of the returned instruments were not usable. Table II gives a tabular report of the distribution and return of the questionnaire.

Statistical Analysis

The information obtained through use of the questionnaire was statistically treated to give direction in answering the following questions:

(1) Do students and graduates of the four institutions respond in a similar way to the suggested items to be included in an optimum program for professional preparation in the field of Instructional Technology?

TABLE II

DISTRIBUTION AND RETURN OF QUESTIONNAIRE

University	Number Sent	Number Returned	Percent Returned	Number Not Usable
Indiana	33	18	55	3
Southern California	35	25	73	0
Michigan State	33	29	88	0
Syracuse	35	17	49	1
Staff	16	13	81	0
Total	152	102	67	4

(2) Do students, graduates, and the teaching-administrative staff respond in the same way to the suggested items?

(3) Is there consistency in the ranking of the items suggested among the five groups responding to the questionnaire?

One-Way Analysis of Variance

To check the response pattern to the questionnaire a One-Way Analysis of Variance test was made on each of the forty-five items listed on the instrument. This test gave an F test of statistical significance for each item, determined a mean value for each item by groups, and also established a grand mean for each of the items.

A tabular indication of the results of the F test as it was applied to each item can be found in Appendix B. Other results are cited below.

The summary of these tests indicates that there is not a significantly different response, statistically, to forty-two of the forty-five items. The test, as it was applied to three of the items did indicate a significantly differing response among the five groups of respondents. These items were: (26) Public School Administration, (35) Statistics, and (45) Internship in Instructional Technology/Educational Communications. Using the parlance of the statistician, the null hypothesis would need to be rejected for these items. At the .05 level the F test shows values for these three items that are larger than that derived from the F Table (2.45). For a summary of these results see Table III, Table IV, and Table V.

Newman-Keuls Sequential Range Test

To ascertain the source of the difference in the response pattern to the three items for which there was manifest significant difference, the Newman-Keuls Sequential Range Test was applied. This test showed that the source of the difference in relation to the item dealing with Public School Administration was the divergence in the response of the student-graduate group from Syracuse University in relation to the response of the student/graduate group from Michigan State University. The rank order listing showed that the Syracuse group rated this experience as being less important than did the Michigan State group.

The Newman-Keuls Test showed that the differences in relation to the item dealing with the Statistics resulted from the lack of agreement in the pattern of responses of both the student/graduate group from Michigan State University and those from Syracuse University giving different responses than did a similar group from the University of Southern California. The student/graduates in the first two groups ranked this item lower in value than did the University of Southern California. All tests were checked at the .05 level of significance.

TABLE III

ONE-WAY ANALYSIS OF VARIANCE

Item # 26 Public School Administration

Source	SS	df	MS	F
Groups	7.5564	4	1.8891	2.50*
Error	70.3312	93	0.7562	
Total	77.8877	97		

*Significant at the .05 level

TABLE IV

ONE-WAY ANALYSIS OF VARIANCE

Item # 35 Statistics

Source	SS	df	MS	F
Groups	8.6262	4	2.1565	3.29*
Error	61.0063	93	0.6559	
Total	69.6326	97		

*Significant at the .05 level

TABLE V

ONE-WAY ANALYSIS OF VARIANCE

Item # 45 Internship in Instructional Technology/Educational Communications

Source	SS	df	MS	F
Groups	6.2699	4	1.5674	3.16*
Error	46.1381	93	0.4961	
Total	52.4081	97		

*Significant at the .05 level

The third item that showed significant difference in the response pattern,among the five groups,related to the "Internship in Instructional Technology/Educational Communications." The source of variance for this item resulted from significantly differing responses by the group from the University of Southern California and Syracuse University indicating a much different ranking for this experience than did the group from Michigan State University. Perusal of the rank order listing showed that the University of Southern California group rated the Internship as eighteenth in the rank order listing. Syracuse University students ranked it twenty-fourth. Michigan State University students and graduates rated it as number two immediately following the Bachelor's degree in their ranking. The responses from the Indiana student/graduate group and the overall staff response did not contribute to the statistical difference found. The statistical tables, and related data to support these findings can be found in Appendix B.

Rank Order Listing

The determination of a grand mean made it possible to give a rank-order listing to all the items included on the questionnaire. A tabular presentation of the ranking is found in Table VI, showing the pre-admission recommendations, and Table VII, showing the experiences and competencies that should be included at the advanced graduate

TABLE VI

RANK ORDER LISTING OF ITEMS FROM THE QUESTIONNAIRE AS DETERMINED BY GROUP MEANS - ADMISSIONS REQUIREMENTS

Rank	Item	Overall Rank*
1	Bachelor's Degree	1
2	Previous Teaching Experience	15
3	Personal Interview/Oral Examination	18
4	Previous experience with Audio Visual materials and equipment	22
5	Master's Degree	24
6	A feasible financial plan for completion of the degree program	27
7	A Grade Point Average of 3.00 (on a 4.00 = A scale) or better	31
8	Acceptable scores on the Graduate Record Examination or the Miller Analogies Test	35
9	Administrative experience in Education	41
10	Experience in library cataloging and filing	44

* Indicates the rank of this Item in the Overall listing of Forty-five (45) Items included on the Questionnaire

TABLE VII

RANK ORDER LISTING OF ITEMS FROM THE QUESTIONNAIRE AS DETERMINED BY GROUP MEANS - COURSE WORK AND/OR EXPERIENCES

Rank	Item	Overall Rank*
1	Learning/Communications Theory	2
2	Systems Theory and Design	3
3	Educational Psychology	4
4	Research and Design of Instructional Materials	5
5	Selection and Use of both Print and Non-Print Instructional Materials	6
6	Selection and Use of Media Equipment	6
7	Administration of Media Facilities	8
8	Curriculum Design and Development	9
9	Internship in Instructional Technology/Educational Communications	10
10	An Overview of Audio Visual Materials and Equipment	11
11	Methods and Techniques of Classroom Utilization of Television	12
12	Programmed Instruction	13
13	Design of Media Facilities	13
14	Diffusion and Dissemination of Innovations (Change Theory)	16
15	Computer Applications in Education	17
16	Still Photography	19
17	Instructional Television Production	20
18	Proposal Writing (for federal, state, and foundation grants, etc.)	21
20	Graphics Production	25
21	Public Relations	26
22	Statistics	27
23	Cinematography	29

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* Indicates the rank of this Item in the Overall listing of Forty-five (45) Items included on the Questionnaire

TABLE VII Continued

Rank	Item	Overall Rank*
24	Business Administration, including Budget and Finance	30
25	Philosophy of Education	31
26	Work in a Cognate Area	31
27	Cybernetics	31
28	Comprehensive Oral and Written Examination in Major and Cognate Area	36
29	Use and Operation of Duplicating Equipment	37
30	Public School Administration	38
31	Fundamentals of Library Science	39
32	Basic Art and Design	40
33	History of Education	42
34	Basic Electronics, as would be required in Equipment Maintenance and Repair	43
35	Foreign Language Competency	44

* Indicates the rank of this Item in the Overall listing of Forty-five (45) Items included on the Questionnaire

level. The similarity of the responses of the five groups made the presentation of this information in graphic form impossible. An attempted line graph was discarded because it was not possible to distinguish the differences in the responses of the five groups.

Kendall's Coefficient of Concordance

To find if there was agreement among the five groups in making a ranking of the forty-five items listed on the questionnaire, Kendall's Coefficient of Concordance was applied to the data. The mean values for each item as derived from each group's response pattern were used in this test. The results are shown in Table VIII in tabular form.

The Coefficient of Concordance derived was highly significant. Perfect agreement would be indicated by 1.0 and lack of agreement by 0.0. The value of 0.8425 derived from these data indicates a high level of agreement among the five groups as to ranking of the items proposed on the instrument used in the survey of "field perceptions."

Comments and Suggestions

Not all of the information obtained through the use of the survey instrument was adaptable to statistical treatment. The instrument was deliberately "open-ended" to encourage comments and suggestions from the respondents. The responses give an indication of additional items

TABLE VIII

THE KENDALL COEFFICIENT OF CONCORDANCE

Item No.	Ranked Data by University Groups				
	U. S. C.	M. S. U.	I. U.	S. U.	Staff
1.	1.0	1.0	1.0	1.0	1.0
2.	34.0	22.0	16.0	24.0	24.5
3.	38.0	29.5	22.0	28.5	28.5
4.	40.5	35.0	33.5	20.0	28.5
5.	24.5	19.5	25.0	17.0	33.0
6.	26.5	8.5	16.0	3.0	20.5
7.	42.0	39.5	40.0	40.0	41.5
8.	44.0	43.0	42.5	43.0	44.0
9.	21.5	13.5	22.0	4.5	24.5
10.	32.0	22.0	30.0	24.0	28.5
11.	4.5	22.0	7.5	4.5	16.5
12.	3.0	11.5	12.5	8.0	11.5
13.	7.5	8.5	7.5	8.0	9.0
14.	43.0	44.0	38.5	42.0	43.0
15.	40.5	41.0	30.0	36.0	38.0
16.	30.0	28.0	42.5	24.0	24.5
17.	21.5	24.5	12.5	11.0	16.5
18.	28.5	31.5	28.0	17.0	33.0
19.	26.5	39.5	33.5	38.0	41.5
20.	10.0	8.5	22.0	8.0	9.0
21.	16.5	17.5	25.0	24.0	20.5
22.	11.0	17.5	14.0	28.5	4.5
23.	36.5	36.0	35.5	41.0	36.5
24.	13.5	26.5	16.0	24.0	4.5
25.	9.0	8.5	3.0	12.0	9.0
26.	36.5	29.5	41.0	35.0	40.0
27.	32.0	26.5	30.0	31.0	36.5

TABLE VIII Continued

Item No.	Ranked Data by University Groups				
	U. S. C.	M. S. U.	I. U.	S. U.	Staff
28.	28.5	15.5	19.0	17.0	33.0
29.	4.5	3.5	7.5	13.5	4.5
30.	19.0	24.5	27.0	17.0	33.0
31.	13.5	5.0	10.5	17.0	4.5
32.	13.5	11.5	19.0	24.0	20.5
33.	2.0	3.5	2.0	2.0	2.0
34.	21.5	19.5	32.0	31.0	33.0
35.	13.5	33.5	19.0	38.0	13.5
36.	6.0	13.5	4.5	8.0	7.0
37.	7.5	6.0	4.5	8.0	11.5
38.	32.0	31.5	38.5	38.0	28.5
39.	21.5	33.5	37.0	31.0	20.5
40.	39.0	42.0	44.0	44.0	39.0
41.	16.5	15.5	10.5	13.5	16.5
42.	45.0	45.0	45.0	45.0	45.0
43.	24.5	37.5	25.0	34.0	16.5
44.	35.0	37.5	35.5	33.0	24.5
45.	18.0	2.0	7.5	24.0	13.5

The Kendall Coefficient of Concordance = 0.8425

Chi-Square Value = 185.3482

Degrees of Freedom = 44

Significant at the .001 level

perceived as being important. Examples are: sensitivity training, simulation, perception theory, mathetics, sociology of education, writing, evaluation, semantics, information storage and retrieval, tele-communications, production, history and science of technology, copyright laws, and work in the affective domain. There was some indicated divergence in relation to such things as minor or cognate studies. Some indicated that such things as the behavioral sciences, experimental design simulation, and in-service work should be included in the program of preparation. To quote one respondent, ". . . I think a doctoral student should have the equivalent of a minor in an 'unrelated field' - history, philosophy, English literature, or math. It is absolutely essential that an instructional technologist have this other dimension." Feeling about the place of the minor or cognate area was not uniform. It was contended by at least one respondent that the cognate should be limited to such things as radio and television, communications, or computer science. Another equally positive point of view proposed that a minor in a "closely related field" should not be permitted.

In addition to the supplementary suggestions that were made to the list of needed experiences and competencies, comments were made relative to the organization and operation of the doctoral level program. Typical of some of these suggestions were that "we should practice what we are trying to teach," and the suggestion that all formal course work should be eliminated in favor of teacher-student and student-student interaction groups or seminars. Cautions were suggested. Some respondents noted that if every item listed on the form were expanded into a course, the preparation program would become endless. Others indicated that many of the items could well be combined into seminar type programs that were designed to make provision for the individualization of instruction in terms of the needs of those enrolled in the program. It was also recommended that consideration be given to the "job description" for the instructional technologist.

The continual need for growth and change must be recognized. Both students and instructional staff need to provide ways to remain aware of developing programs and concepts. They must continue to learn. This contention was made by a number of the respondents in the staff group. They also said that preparation programs must make provisions for the needs of the future. Planning to meet the needs of today's job market is not enough.

Overall, the comments and suggestions embodied a number of important ideas for consideration in the formulation of an optimum preparation program in instructional technology at the professional level.

Recommendations from Scholars, Innovators, and "Philosophers"

In February, 1969, Gagne' made the statement that, "there are three components to the problem of obtaining qualified instructional technologists. They are selection, education, and on-the-job training."[1] He went on to say that the "crux of the problem is one of designing a program that will provide the proper emphasis or weighting to each of these factors."[2]

Hall, in his report for the United States Office of Education, in 1964, made some more specific recommendations for consideration in the "professional training of Audiovisual Communication Specialists." Noting that there was a variety of kinds of assignments in the field, he proposed that the audiovisual profession adopt a professional pattern similar to that of the engineering or accounting field. No one would be admitted without the baccalaureate degree and initial competence in one of the specialized areas, i. e. television, graphics, electronics, teaching, or librarianship. More responsible assignments would require additional time spent in preparation in the areas of educational psychology, advanced statistics, sociology, philosophy, logic, and communication theory. Further, full admittance would be based upon the successful completion of a series of examinations, modeled after those required for the license as a certified public accountant.[1]

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[1] Robert Gagne', Characteristics of Instructional Technologists, A Presentation to a Symposium on Instructional Technologists, American Educational Research Association Annual Meeting, University of California at Berkeley, February 6, 1969, p. 1.

[2] Ibid, p. 1.

Still earlier, Finn made some observations about "Professionalizing the Audio-Visual Field." At that time he pointed out that "most professions not only require this long period of training but are also in substantial agreement as to the nature of this training."[2] He went on to indicate that the "training for audio-visual directors and other personnel . . . is still in the thinking stage."[3] He suggested that the audio-visual profession still had some developing to do before it could qualify as a true profession. Progress was slow, as has been noted earlier. Ely noted in 1960:

> . . . the present preparation of professional personnel for the audio-visual field largely perpetuates the traditional functions of the audio-visual specialists, i. e. that of procurement, distribution, maintenance, production, and the optimum use of materials and equipment. These programs are not developing the

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[1] Robert O. Hall, The Content and Pattern for the Professional Training of Audiovisual Communications Specialists, U. S. Office of Education, Final Report, Project No. OE 2-16-029, N. D. E. A., Title VII, No. B 208.

[2] James D. Finn, "Professionalizing the Audio-Visual Field," Audiovisual Communications Review, Vol. 1, No. 1, Winter 1953, p. 9.

[3] Ibid, p. 9.

> leaders and researchers who are so desperately needed at the present time.[1]

What should be the components of the training program for these needed leaders and researchers? Are the same competencies and experiences needed by the instructional technologist? Gagne', in the paper cited above, makes some very specific recommendations. He says:

> . . . specific qualifications will vary with the job. But what kinds of characteristics constitute the irreducible minimum for the instructional technologist? These appear to me to fall into three categories. The first is attitudes or _values_. Second, there is some specialized _knowledge_ which is needed. And third, perhaps most obvious of all there are intellectual skills, which are often called methodologies.[2]

He discusses values in a general way and notes that knowledge should be of two types. One of these is the knowledge of "subject matters" and the other is the knowledge of theory. He proposes a number of intellectual skills: analyzing learning outcomes, techniques of measurement of outcomes, the constructing of empirical tests of learning outcomes, statistical competence, and communications under the methodologies heading.[3]

Wiman sent a questionnaire to thirty-five selected leaders in the field of instructional technology to determine which courses they would want to have included in a master's level program. He reports this in terms of the percent indicating that a particular course would be "of considerable or great value." Learning theory was ranked first followed by mass media and communications theory. Motivation, perception and an internship or thesis were included next. Communications and the library were selected by seventy percent of the group who responded. History of Education got support from only twenty-five percent of those who responded, and was at the bottom of the list.[1]

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[1] Donald P. Ely, "The Communications School: Neophyte in Higher Education," _Audiovisual Communications Review_, Vol. 18, No. 3, (September-October 1960), p. 28.

[2] Robert M. Gagne', _Characteristics of Instructional Technologists_, A Presentation to Symposium on Instructional Technologists, American Educational Research Association Annual Meeting, University of California, Berkeley, February 6, 1969, p. 2.

[3] Ibid, p. 6-7.

Mars indicates that the best pre-professional program rests on the base of liberal arts study. He cites specifically such things as psychology, sociology, history, anthropology, and the sciences as basics. He contends that this should be followed with a professional sequence that will introduce communications, media, the learning and teaching process, and clinical or internship experiences.[2]

In a discussion of the differences of the role of the professional and the paraprofessional, Swartout notes that:

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[1] Raymond V. Wiman, "An Interdisciplinary Approach to Planning a Program of Professional Preparation for Media Specialists," Audiovisual Instruction, Vol. 12, No. 2, (February 1967), p. 112-113.

[2] Walter J. Mars, "Developing Appropriate Media Competencies," The Journal of Teacher Education, Vol. XVII, No. 4, (Winter 1966), p. 433-435.

> The professional person in charge of media programs is required through certification offices to have either the experience or the degrees. If he has the academic degrees, it means at least: (1) four to seven years of college, (2) possession of a teaching certificate, and (3) one or more years of successful teaching experience.[1]

In a Position Paper, edited by Norberg for the Board of Directors of the Department of Audiovisual Instruction of the National Education Association, an outline of the preparation of the "Media Professional in Education" was given; pointing out that the media professional could specialize or might move toward a more comprehensive approach. The Paper cites a number of elements that would need to be included in the preparation program:

1. Utilization and evaluation of educational media and materials.
2. Design and production of various types of instructional materials
3. Organization of media collections
4. Administration and supervision of media programs
5. Applications of various types of technologies to instruction
6. Communication, learning, and perception theories as related to media and the utilization of instructional materials in education
7. Curriculum development and recent instructional trends at the preschool, elementary, secondary, collegiate, and/or adult levels

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[1] Sherwin G. Swartout, "Professional or Paraprofessional?," Audiovisual Instruction, Vol. 12, No. 2, (February 1967), p. 128.

8. Development of supervisory and in-service education activities.[1]

Also suggested in the Paper is the idea that beyond this general preparation, the media professional may want to specialize or take further work in librarianship, information science, advanced work in educational broadcasting, programmed instruction, instructional systems, computer-assisted instruction or behavioral research.[2]

Meierhenry says, "There are three types of competencies which all teachers should have . . ." First, is the need for theory. The second he calls "message design" or "programing." The third has to do with "skills in the production of materials."[3] If these competencies are needed by teachers it must then be assumed that those who teach teachers must also have these competencies. Broudy suggests that, ". . . the faculty of an institution turning out college teachers of education would require a staff with two types of training: those qualified to teach general foundations and those qualified to give instruction and to guide research in each of the specialties."[1]

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[1] Kenneth Norberg, et al, "The Role of the Media Professional in Education," A Position Paper prepared for the Board of Directors of the Department of Audiovisual Instruction, National Education Association, Audiovisual Instruction, Vol. 12, No. 10, (December 1967), pp. 1026-1029.

[2] Ibid, p. 1029.

[3] Wesley C. Meierhenry, "Teacher Competencies Project," Audiovisual Instruction, Vol. 12, No. 10, (December 1967), p. 1031.

Heinich has called attention to another facet of the use of instructional technology in education. He suggests that the teacher for the school of tomorrow will not only need to be aware of the potential of media materials in supporting the traditional type of self-contained classroom instruction but will need to become aware of the use of media to deliver the message and to make it possible to relate the skills and techniques of the master teacher to an ever widening circle of students. He talks about a "man-machine-man system." He says:

> Programs of teacher preparation must provide for training in three major areas. The first area concerns handling media normally under the control of the classroom teacher. . . . The second area deals with the management of instructional problems at times when mediated teachers and classroom teachers work together. The last area to deal with is the toughest. . . the number of mediated teachers will increase dramatically in the next twenty years. . . . Every student in pre-service training should be required to teach a substantial piece of content in his major field in mediated form.[2]

Goodlad asserts, ". . . to assume that school, as it now exists, maintains the central thrust in changing behavior is to be misled."[1] It may well be that the educational complex is too late to catch up with the needs of society. In spite of the contention of persons such as Goodlad, some educational personnel still argue about the feasibility of the use of media. Sheer numbers as well as relative inaccessibility of groups of urban and rural areas have impeded the progress of improvement in instructional techniques. Both of these factors have had an influence, but it is not permanent. Dale says:

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[1] Harry Broudy, "The Education of Teachers of Teachers," The Journal of Teacher Education, Vol. XIII, No. 3, (September 1962), p. 290.

[2] Robert Heinich, "The Teacher In An Instructional System," in Media Competencies for Teachers, Wesley C. Meierhenry (ed), United States Office of Education, Contract No. 5-0730-2-12-6, Title VII, Part B. 1966, pp. 26-28.

> Some persons discuss instructional technology as though there were a real choice whether we should introduce it in our schools. There is no such choice. Our only choice is whether we use educational technology wisely and planfully or whether we use it grudgingly, ineptly, planlessly.[2]

The widespread institution of instructional technology into the operating framework of public education is faced with a number of problems. Adequate financial support is only one of the concerns of the professional in education. Just as real, and possibly more important in the long run, is the shortage of personnel with suitable preparation. Hayes notes:

> All properly organized school districts have the financial ability to employ "hardward" specialists. What should be the qualifications for such persons? Should they be technicians thrust into education to apply their trade to the learning process?

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[1] John I. Goodlad, "The Future of Learning and Teaching," AudioVisual Communications Review, Vol. 16, No. 1, (Spring 1968), p. 12.

[2] Edgar Dale, "The Teacher and Technology," in Can You Give The Public What It Wants?, Cowles Educational Corporation, New York, 1967, p. 138-142.

> Or should they be educators whose responsibility is to maintain currency on technology and correlative implications for learning? The potency of many of the products and the amount of money devoted to hardware argue for the latter approach, and rapidity of change dictates early refinement of preparation programs to meet the need.[1]

There is no ideal program, according to Larson. It should not be the goal of the professional to attempt to delineate such a program, he contends.[2] This does not mean that there is no feasible type of program but rather, that we need to allow for diversity and individual needs in the planning and implementation of any program. Carpenter maintains that, "A multiphasic problem requires a pluralistic answer. There is no single solution to the complex problem of learning because it is so enormously complex."[3]

The fact that the problem of training and educating professional personnel is both "multiphasic" and not universally agreed upon, should not preclude the recognition of the vast amount of work that has been done in relation to improving the quality and quantity of professional preparation programs for the instructional technologist.

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[1] Dale K. Hayes, "Professional Educators: Policy Makers or Technicians," Educational Leadership, Vol. 25, No. 8, p. 726.

[2] L. C. Larson, Address to the PEMS Commission section, D. A. V. I. Convention, Portland, Oregon, 1969; from an audio tape of the session.

[3] C. R. Carpenter, "A Constructive Critique of Educational Technology," AudioVisual Communications Review, Vol. 16, (Summer 1968), p. 17.

Summary

The requirements for admission to the doctoral program in Instructional Technology are analogous at the institutions included in this study. Any differences would be in degree rather than kind. All of the schools require a baccalaureate degree. A minimum grade point average is also required. This ranges from 2.50 at Indiana University through 3.25 at Syracuse University. Each of the universities requires preliminary examination. The Graduate Record Examination is preferable. The Miller Analogies Test is acceptable in lieu of G. R. E. scores at one of the schools. Previous teaching experience and the requirement for a personal interview are both encouraged, but are not rigid injunctions at all of the schools.

Catalog descriptions, assorted course syllabi, handouts to students, and personal interview indicate that there is significant commonality in the experiences provided and the competencies needed at the advanced graduate level in all of the universities included in the study. Aside from some of the basic and/or tool courses it is also apparent that the programs are not mirror images of one another. There is inequality in the breadth of the programs offered under the aegis of the Department of Instructional Technology. This inequality is partially counter-balanced by improved interdepartmental arrangements within the institutions. Overall, the course title and catalog description leave something to be desired in making a clear and complete explanation of the scope of the course offering. A better indication of the true composition of the course can be obtained from course syllabi and handouts given to students. On this basis, it is apparent that many of the experiences given and competencies required are the same. They are not, however, always developed and taught in courses with similar descriptions or catalog numbers.

The programs at all of the schools are in a state of flux. Indiana University has added a number of experimental courses to their offering. Syracuse University has just completed some redesigning and changes in the designation of some of their course work and Michigan State University has a faculty-student group working on revision of the total program. The University of Southern California is working under a particularly difficult evaluation of their total program caused, at least partially, by the passing of Dr. James Finn.

"Field perceptions" were made through the use of a written questionnaire. Students, graduates, and staff from four of the five institutions that comprise the University Consortium in Educational Media and Technology responded to a listing of suggested items to be included in the preparation program for the doctoral level professional in the field of Instructional Technology. These responses were treated statistically with a One-Way Analysis of Variance for each item. Significant differences in response patterns were checked and analyzed through the use of the Newman-Keuls Sequential Range Test. Kendall's Coefficient of Concordance was applied to all of the data to determine if there was agreement among the five groups of respondents.

The One-Way Analysis of Variance indicated that the total group of respondents showed little difference in their responses to forty-two of the forty-five items suggested. They did show some divergence in their response to public school administration, statistics, and the internship for instructional technologists. This test also determined a grand mean value for each of the items and also made it possible to list them in rank order. Those items having a low mean value were those judged by the respondents to be "most desirable" in the doctoral level program. The minimum admission requirement suggested was a bachelor's degree. Items related to academic experiences were learning and communications theory, systems theory and design, educational psychology, research methods and design, selection and use of print-non-print materials and media equipment, the administration of media facilities, curriculum design and development, and an internship in instructional technology/educational communications. Many of the items were rated as "desirable - not essential." The lowest item on the list was foreign language competency. Ranked just above this were the items relating to library science, basic art and design, and electronics.

The Newman-Keuls Sequential Range Test was used to pin-point the sources of difference. In all of the instances of significant difference, the staff group response correlated positively with that of the student groups. Sources of difference were between the student-graduate groups from the four institutions.

Kendall's Coefficient of Concordance showed a very significant positive relationship among all five of the groups making responses. A perfect correlation would have been shown by a derived value of 1.0. The derived value for this set of data was 0.8425.

Recommendations from leaders in the field were varied. The more recent articles and addresses placed more emphasis upon such things as values, knowledges of subject matters and theory, and "intellectual skills." Programs need to be adapted to meet individual needs. Also recommended were patterns of program development that would be modelled after those for engineers or accountants. In a Position Paper prepared for the Department of Audio Visual Instruction eight areas were recommended for inclusion in a general core for media professionals. They were utilization and evaluation of educational materials and media, design and production of materials, organization of media collections, administration and supervision of media programs, the applications of technologies to instruction, communication, learning and perception theories, curriculum development, and the development of supervisory and in-service education activities.

The function of media and the relation of instructional technology to the whole educational framework has been the subject of conjecture. It was suggested that teachers need not be schooled only in the use of media in the classroom, under teacher control, but also how to use the variety of media applications as message sources, i. e. the teacher on television or the one who designs and implements the "instructional package." Further, as more and more of the information becomes available, the teacher needs to be able to be the television teacher and/or the designer of the instructional package. He needs some training for this kind of experience in his pre-service work.

Changes in preparation programs are more evolutionary than revolutionary. Institutions have made, and will need to continue to make, alterations in the structure of preparation programs for both the teacher and the teacher of teachers to meet the ever-changing demands of society.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The growth of formal education and the increasingly important role of instructional technology have been concurrent throughout the history of man. Even in the Dark Ages the use of symbols helped men to communicate. With the return of civilization the use of more abstract forms of message design gave additive strength to the development of instructional technology. In recent years, more sophisticated "man-machine" systems have again pushed formal education into the spotlight. Criticism has come with this recognition. Both lay and professional people have expressed concern about the adequacy of the formal education at all levels. An integral part of this concern relates to personnel and the training that they have for the job that they are assigned to do. Because of the growth of mass media and more sagacious forms of communication, those who have responsibility for the improvement of instructional programs have borne the brunt of much of the criticism that has been leveled at education in general.

The purpose of this study has been to gain some insight into the kinds of competencies and experiences that are needed by professional level people in the field of instructional technology. With this augmented insight an indication of some of the elements of an optimum preparation program has been made.

A number of different levels of supporting information were needed before attempting to make this kind of discrimination. They are best described by asking a number of questions about the present situation and gathering some of the ideas from those who have spent both effort and time in getting an overall point of view of the educational complex.

The first question relates to the current status of preparation programs for the professional level person in instructional technology. The answer to this can be partially obtained from careful perusal of the general catalogs, special catalogs and brochures, class outlines and handouts, and other kinds of promotional material. This was the avenue used for this study.

Secondly, how do the people in the field perceive the preparation program for instructional technologists at the doctoral level? What, in their opinion, are the most significant elements of this kind of program? This was determined from the responses that a selected group of people made to a written questionnaire. These responses were statistically treated to ascertain if there was consensus among groups and among the individual respondents. There was. The responses were also checked to decide if there was a hierarchical ranking of the elements, according to perceived importance by the responding groups. Again there was. This was found to be consistent, statistically, for forty-two of forty-five proposed items.

In order to temper the indicated program proposals derived from the first two sources of data a third set of factors were introduced into the prospectus. These were the recommendations of "scholars," "innovators," and "philosophers" working in the field. The intent of this addition was to make reasonable allowance for averages in the response patterns, but also to prevent the obvious in "equating averages with oughtness."

Conclusions

The following conclusions were reached using this threefold data base.

1. There is limited variation in the doctoral preparation programs in instructional technology at the four institutions included in this study. This difference is largely in organizational pattern and the breadth of course offering included under the aegis of the Department of Instructional Technology rather than a difference in the program content. There is not as much discrepancy in the program content as cursory examination would lead one to believe. Interdepartmental arrangements exist in all of the universities. The extent to which these kinds of services are utilized varies a great deal and appears to

be dependent upon the type of departmental status.

2. Experiences that are provided within the preparation programs are similar. As would be expected, the course numbers, titles, and catalog descriptions vary from one school to another. Syllabi, brochures, student oriented handouts, and other promotional materials indicate, however, that there is notable correspondence in terms of the overall objectives of the preparation programs.

3. Admissions requirements are analogous for the four universities. All require a bachelor's degree as the beginning point. A grade point average ranging from 2.50 through 3.25 (on a 4.00 = A scale) is required by all of the institutions. A preliminary examination, either the Graduate Record Examination or the Miller Analogies Test, is required by all four schools. Previous teaching experience is required by two of the universities but is only suggested by the other two for formal admission as a matriculated student. Personal interview is suggested by two of the schools and is stipulated by the other two. A Master's degree or its equivalent is required by one school. The others do not make the requirement but recommend such a degree.

4. There is agreement among the groups surveyed as to the desirability of specified experiences in an optimum program for the preparation of professional level people in the field of instructional technology. The statistical treatment of the scaled responses to the

questionnaire indicates that students, graduates, and members of the teaching-administrative staff from the universities are in accord concerning the elements of an optimum preparation program. The One-Way Analysis of Variance test of each of the items did not show any significant difference on forty-two of the forty-five proposed items. Kendall's Coefficient of Concordance showed high concurrence among the groups in the ranking of the elements proposed. (0.8425).

5. Students, graduates, and staff members rank learning and communications theory, systems theory and design, educational psychology, research method and design, selection and use of instructional materials and media equipment, the administration of media facilities, and curriculum design and development as being "highly desirable" (somewhere between essential and desirable on the scale used on the questionnaire) elements in the preparation program for doctoral level people in the field of instructional technology. These should be developed at both the knowledge and the skill levels.

6. The internship in instructional technology, an overview of media materials and equipment, methods and techniques of classroom television, programmed instruction, the design of media facilities, and previous teaching experience were rated more in the "desirable - not essential" ranking. Still lower, in the "useful" category, were the "tool" kinds of experiences. Examples of some

of these are still photography, television production, statistics, cinematography, and business administration. Cautions were expressed by many of the respondents relative to placing too much emphasis upon the "machine" portion of the "man-machine system" known as instructional technology. Again, emphasis should be given to the development of both knowledge and skill.

7. There was almost universal agreement in indicating that the foreign language requirement for the doctoral degree is inappropriate. This item was given the lowest ranking on the total list. Also of interest was the relatively low ranking of the items relating to library science and library cataloging and filing.

Implications of Study

On the basis of the findings and conclusions of this study, it is recommended that:

1. Funds and time be provided for those who do the actual instruction to meet together to discuss their programs and to begin working out some of the suggested details for achieving the objectives of the University Consortium in Educational Media and Technology. This will involve meetings of those who are doing the teaching as well as those in administrative positions. It may well be that students in the advanced graduate program can make significant contributions to this kind of instructional development. More effective and affective

communication resulting from these kinds of face-to face meetings will have laudatory effects upon program development and cooperation.

2. Provisions be made to permit advanced graduate students to work in programs that are not hampered by the confines of traditional course organization and the relation of formal courses, seminars, and independent study. Rather, it is proposed that some arrangement be made to permit both instructional staff and students to work together in instructional teams, with definite objectives and an opportunity to solve real problems.[1]

3. A reassessment of the role of the Department of Instructional Technology within the College of Education specifically, and the total university generally, be made. This will help increase the scope of the preparation program. This evaluation has a number of facets. One is a survey of the internal relationships that exist between and among the courses and instructors who are assigned directly to the Department of Instructional Technology. The other would involve the relationship of Instructional Technology to other departments within the College, i. e. curriculum, administration, special education, reading, teacher education, and media or instructional technology. Another part of this reassessment

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[1] Personal interview with Dr. Paul W. F. Witt, Director of Instructional Development, Instructional Materials Center, Michigan State University, August, 1969.

should include role definition in terms of the service function, the training function, and the instructional development function throughout the total university.

4. The requirement for a foreign language competency be dropped for the doctoral level degree in Instructional Technology. Whether this is done through the limiting of Instructional Technologists to the Doctor of Education degree or changing the requirements for the Doctor of Philosophy degree has not been determined by this study. (Note: The foreign language requirement has recently been changed at Michigan State University.) This may be the subject of some additional study.

5. The relationship between Instructional Technology and Library Science needs to be investigated. This study would infer that the relationship is not a positive one at this time. The ostensive agreement between these two fields appears to exist more at the administrative level than it does at the functional level. The respondents to the survey instrument used in this survey indicate that people in the field see Library Science as being a relatively unimportant link in the total field of Instructional Technology.

6. The preparation program in Instructional Technology should provide many different opportunities for a general core of experiences that would be available to all advanced graduate students. Integral parts of this common core should include such things as learning and

communications theory, systems theory and design, educational psychology, research methods and design, selection and use of instructional materials and equipment, the administration of media facilities, and curriculum design and development. Where possible, an internship in Instructional technology should be provided. In order to permit some experience and competency development in specialized areas beyond the general core, opportunities should be provided to work in systems design, learning theory, research, television, photography, programmed instruction (for both computer and printed materials), design and administration of media facilities, cinematography and others of the specialty areas.

An optimum program offering including all of the specialty areas in the field can be offered only with extreme difficulty by all of the schools that have instructional departments dealing with Instructional Technology. The proposal of the University Consortium in Educational Media and Technology referring to the exchange of students and/or instructional personnel should receive prompt consideration by all of the institutions comprising the membership of that organization. This kind of cooperation will permit them to continue their leadership in the development of new and innovative programs for the education of professional people in the field.

Summary

It has been a popular pastime to decry the lack of uniformity in course offerings and experiences provided by higher education institutions working in the field of Instructional Technology. The results of this study would infer that at the present time this is more of a semantic exercise rather than one with substance.

There is similarity in the kinds of experiences provided, though they are not always found in analogous courses. Detailed study of course syllabi and related materials suggest that they are available, nevertheless. Differences in overall concept on the part of both teacher and student dictate the relationship of these experiences. It is this quality that provides the unique character of each school. The divergence that exists in the organizational structure of the departments results from the perceptions of personnel, not only within the organization, but in their associations with related departments across the university.

Recognition of personalities and inter-personal relationships implies that no two students are going to obtain identical preparation experiences. To deprecate these differences would be short-sighted. They are the strengthening qualities of any developing program. Only as an overall program is based upon a broad, multi-faceted foundation can it be flexible enough to make its maximum contribution to a changing, growing society.

Some have contended that a viable program for preparation cannot be defined until a comprehensive job description is completed. The rationale for this contention is sound but may be limiting when considered in the light of the rapidity of change. Neither job descriptions nor the programs for preparing people to take the jobs described can remain static. They are both subject to constant re-evaluation and change. The schools included in this study are currently making a concerted effort to make their programs more functional for their advanced graduate students.

Guidelines

On the basis of the findings of this study and personal experience, both within and prior to enrollment in the doctoral level program, the writer proposes some "guidelines" or "ground rules" for consideration in the development of new doctoral level preparation programs in the field of Instructional Technology.

1. There should be a more systematic way of assessing the "initial competency" of persons entering into doctoral level programs. Evaluation of previous academic work, related job experiences, scores on standardized evaluation instruments, and personal interview should be used in this determination. The initial assessment has a double purpose: (1) to permit the institutional

representatives to evaluate the candidate and suggest a curricular pattern that will best meet the individual needs of the candidate, and (2) permit the candidate to evaluate the institution and the instructional offering in terms of his individual needs and desires.

2. There should be a "common core" of learning experiences for all persons working at professional levels in Instructional Technology. This is not necessarily a series of courses but rather activities designed to develop and assess skills and knowledges permitting the individualization of program structure. All post-baccalaureate programs in this field should include work in theory and academic areas relating to learning, communications, systems design, research, educational psychology, and curriculum design as well as work in the selection and utilization of instructional materials and media equipment.

3. The learning experiences provided within the preparation program should be "overlapping." Rather than being organized in a ladder-like pattern they should assume more of a "Venn Diagram" type of configuration with those working at the doctoral level having the opportunity and responsibility for more in-depth study than either the master's level or specialist's level candidates. Determination of the ultimate depth of study and experience in a given area should be made by the individual, in

consultation with his advisory committee. It should take into consideration the role that he expects to fill following the completion of the formal preparation program.

4. The preparation program at the doctoral level should be inter-disciplinary. Experiences should be provided within the program for work in the behavioral sciences, i. e., education, psychology, sociology, political science, anthropology, communications, research and statistics. Every effort should be made to encourage individuals preparing to work at the professional level in the field of Instructional Technology to have a broad knowledge base in one or more of these areas.

5. To adequately support the inter-disciplinary approach referred to above, provision should be made for a "team approach" to the staffing of the post-baccalureate instructional program. Within the staff structure there should be persons representing a variety of knowledges, skills, and expertise.

6. In drawing constraints around the preparation programs recognition must be made of the rapidity of change as well as the growth of knowledge. Provision for the termination of the formal instructional program should make allowance for a reasonable time commitment (three to four years) beyond a bachelor's degree. Ideally, the program structure would be such that students develop not only skill with the learning process but also an awareness and

philosophy of the necessity for continual personal learning.

7. Recognition of the changes that have been, and will continue to be, made in the "needs" for professional level personnel in the field of Instructional Technology should preclude the potential rigidity that tends to plague innovative programs. Continued flexibility must be an integral part of any truly functional preparation program.

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APPENDIX A

THIS QUESTIONNAIRE IS INTENDED TO SAMPLE THE PERCEPTIONS OF PERSONS ACTUALLY WORKING IN THE FIELD OF INSTRUCTIONAL TECHNOLOGY/EDUCATIONAL COMMUNICATIONS TO HELP DETERMINE WHAT EXPERIENCES AND/OR COMPETENCIES ARE VALUABLE ELEMENTS OF THE PREPARATION PROGRAMS FOR PROFESSIONAL PERSONS AT THE DOCTORAL LEVEL.

Please indicate your reaction to the proposed items by writing the appropriate number from the RATING Column and by placing a Check (✓) in the Second Column if you have had this experience. Any observation or comment that you may wish to make about any of the items will be appreciated.

RATING SCALE

1. Necessary - Essential
2. Desirable - Not Essential
3. Useful - Not Essential
4. Inappropriate - Of No Value
5. No Opinion

Prior to admission to the Doctoral level program in Instructional Technology/Educational Communication the candidate should have:	RATING	Have had this experience (✓)
1. A Bachelor's Degree Comment:		
2. A Master's Degree Comment:		
3. A Grade Point Average of 3.0 (on a 4.0 scale) or better Comment:		
4. Acceptable scores on the Graduate Record Examination and/or Miller Analogies Test Comment:		
5. Previous experience with audio visual materials and equipment Comment:		
6. Previous Teaching Experience Comment:		
7. Administrative experience in education Comment:		
8. Experience in Library cataloging and filing Comment:		
9. Personal interview/oral examination Comment:		

RATING SCALE

1. Necessary - Essential
2. Desirable - Not Essential
3. Useful - Not Essential
4. Inappropriate - Of No Value
5. No Opinion

	RATING	Have had this experience (✓)
10. A feasible financial plan for the completion of the degree program Comment:		
General Comment:		
DOCTORAL STUDIES SHOULD INCLUDE COURSE WORK AND/OR EXPERIENCES IN THE FOLLOWING:		
11. An Overview (survey) of audio visual materials and equipment Comment:		
12. Selection and use of both print and non-print instructional materials Comment:		
13. Selection and utilization of media equipment Comment:		
14. Basic Electronics, as would be used in equipment maintenance and repair Comment:		
15. Basic Art and Design Comment:		
16. Graphics Production Comment:		

RATING SCALE

1. Necessary - Essential
2. Desirable - Not Essential
3. Useful - Not Essential
4. Inappropriate - Of No Value
5. No Opinion

	RATING	Have had this experience (✓)
17. Still Photography Comment:________________		
18. Cinematography Comment:________________		
19. Use and operation of duplicating equipment Comment:________________		
20. Methods and techniques of classroom utilization of television Comment:________________		
21. Instructional Television Production Comment:________________		
22. Programmed Instruction Comment:________________		
23. Fundamentals of Library Science Comment:________________		
24. Computer Applications in Education Comment:________________		
25. Administration of Media Facilities Comment:________________		
26. Public School Administration. Comment:________________		
27. Business Administration, including Budget and Finance Comment:________________		
28. Proposal Writing (for federal, state, and foundation grants, etc.) Comment:________________		

RATING SCALE

1. Necessary - Essential
2. Desirable - Not Essential
3. Useful - Not Essential
4. Inappropriate - Of No Value
5. No Opinion

	RATING	Have had this experience (✓)
29. Systems Theory and Design Comment:		
30. Personnel Management/Development Comment:		
31. Curriculum Design and Development Comment:		
32. Diffusion and Dissemination of Innovation (Change Theory) Comment:		
33. Learning/Communications Theory Comment:		
34. Public Relations Comment:		
35. Statistics Comment:		
36. Research Method and Design Comment:		
37. Educational Psychology Comment:		
38. Cybernetics Comment:		
39. Philosophy of Education Comment:		
40. History of Education Comment:		
41. Design of Media Facilities Comment:		

RATING SCALE

1. Necessary - Essential
2. Desirable - Not Essential
3. Useful - Not Essential
4. Inappropriate - Of No Value
5. No Opinion

	RATING	Have had this experience (✓)
42. Foreign Language Competency Comment:		
43. Work in a Cognate Area Comment:		
44. Comprehensive Oral and Written Examinations in Major and Cognate Comment:		
45. Internship in Instructional Technology/Educational Communications Comment:		

This is not an exhaustive listing of the experiences and course work that need to be included in a Doctoral Program in Instructional Technology/Educational Communications. Chances are that something that you feel strongly about has not been included. If this is so, will you please indicate those things in the blanks below.

1.
2.
3.
4.
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6.
7.
8.
9.
10.

Any comments and/or observations that you may wish to make about the proposed project will be appreciated: ________________________________

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If you would like an abstract of the results of the study, please indicate your name and mailing address below:

____
Name

____
Number and Street

____
City State Zip Code

THANK YOU!

MICHIGAN STATE UNIVERSITY EAST LANSING · MICHIGAN 48823

INSTRUCTIONAL MEDIA CENTER

Dear

May we have your help? As member of the instructional staff of one of the leading institutions in the United States having a functioning doctoral level program in the field of Instructional Technology/Educational Communications you are in a key position to help assess the competencies and experiences that should be incorporated into a program that will provide the most complete and effective preparation for those who are enrolled.

Enclosed is a questionnaire that suggests a number of different experiences and courses that may be included in such a preparation program. Will you please react to this listing? It is not an exhaustive list. Any additional items that you may wish to add will be appreciated. Space is provided on the last page of the questionnaire for these comments and/or suggestions.

We appreciate your consideration of this request and hope that it is not too much of an infringement upon your valuable time. A stamped self-addressed envelope has been enclosed for your convenience in returning the questionnaire to us. We shall look forward to hearing from you soon.

Sincerely yours,

Elwood E. Miller

Elwood E. Miller, Associate Professor
of Education and Director of the EPDA
Institutes

G. Gardner Snow

G. Gardner Snow, Graduate Fellow
Title VI-B Institute

Enclosure

MICHIGAN STATE UNIVERSITY East Lansing, Michigan 48823

Instructional Media Center

Dear

May I have your help?

You are in a key position to assess the competencies and experiences that should be required of doctoral candidates in the field of Instructional Technology/Educational Communications. As a student, or former student, in this area you have opinions and perceptions about the experiences that you are having or have had concerning your own preparation program.

Enclosed is a questionnaire that suggests a number of different experiences that are designed to help students achieve an optimum competency to serve in the leadership/teaching role in higher education. It is not an exhaustive list. Additional items that you may wish to add to the list will be appreciated. Space is provided on the last page of the questionnaire for any additional suggestions that you may have.

Thank you for your consideration of this request. I hope that it is not an infringement upon your valuable time and have taken the liberty of enclosing a stamped self-addressed envelope for your convenience in returning the questionnaire to me.

Sincerely yours,

G. Gardner Snow

Enclosure

APPENDIX B

TABLE 9

ANALYSIS OF VARIANCE REPORT

Item # 1 Bachelor's Degree

Source	SS	df	MS	F
Groups	0.2740	4	0.0685	0.81
Error	7.8994	93	0.0849	
Total	8.1743	97		

Item # 2 Master's Degree

Source	SS	df	MS	F
Groups	1.7386	4	0.4346	0.62
Error	65.2049	93	0.7015	
Total	66.9795	97		

Item # 3 A Grade Point Average of 3.0 (on a 4.0 scale) or better

Source	SS	df	MS	F
Groups	2.4233	4	0.6058	0.84
Error	66.9235	93	0.7196	
Total	69.3469	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 4 Acceptable scores on the Graduate Record Examination and/or Miller Analogies Test

Source	SS	df	MS	F
Groups	5.9297	4	1.4824	1.87
Error	73.6723	93	0.7921	
Total	79.6020	97		

Item # 5 Previous experience with audio visual materials and equipment

Source	SS	df	MS	F
Groups	1.0496	4	0.2624	0.38
Error	64.9503	93	0.6983	
Total	66.0000	97		

Item # 6 Previous Teaching Experience

Source	SS	df	MS	F
Groups	4.6611	4	1.1652	1.96
Error	55.2265	93	0.5938	
Total	59.8877	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 7 Administrative experience in education

Source	SS	df	MS	F
Groups	1.8053	4	0.4513	1.05
Error	40.0416	93	0.4305	
Total	41.8469	97		

Item # 8 Experience in library cataloging and filing

Source	SS	df	MS	F
Groups	1.2189	4	0.3047	0.66
Error	42.6179	93	0.4582	
Total	43.8367	97		

Item # 9 Personal interview/oral examination

Source	SS	df	MS	F
Groups	2.8104	4	0.7026	1.29
Error	50.7507	93	0.5457	
Total	53.5612	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 10 A feasible financial plan for the completion of the degree program

Source	SS	df	MS	F
Groups	2.7217	4	0.6804	0.87
Error	72.9109	93	0.7839	
Total	75.6326	97		

Item # 11 An Overview (survey) of audio visual materials and equipment

Source	SS	df	MS	F
Groups	4.0062	4	1.0015	1.19
Error	78.2386	93	0.8412	
Total	82.2448	97		

Item # 12 Selection and use of both print and non-print materials

Source	SS	df	MS	F
Groups	2.1626	4	0.5406	0.83
Error	60.2965	93	0.6483	
Total	62.4591	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 13 Selection and utilization of media equipment

Source	SS	df	MS	F
Groups	0.2537	4	0.0634	0.10
Error	60.2054	93	0.6473	
Total	60.4591	97		

Item # 14 Basic Electronics, as would be used in equipment maintenance and repair

Source	SS	df	MS	F
Groups	3.4317	4	0.8579	1.22
Error	65.2621	93	0.7017	
Total	68.6938	97		

Item # 15 Basic Art and Design

Source	SS	df	MS	F
Groups	1.9905	4	0.4976	0.71
Error	65.0401	93	0.6993	
Total	67.0306	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 16 Graphics Production

Source	SS	df	MS	F
Groups	0.6815	4	0.1703	0.23
Error	67.4919	93	0.7257	
Total	68.1734	97		

Item # 17 Still Photography

Source	SS	df	MS	F
Groups	1.0844	4	0.2711	0.44
Error	57.5379	93	0.6186	
Total	58.6224	97		

Item # 18 Cinematography

Source	SS	df	MS	F
Groups	1.8481	4	0.4620	0.66
Error	65.1416	93	0.7004	
Total	66.9897	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 19 Use and operation of duplicating equipment

Source	SS	df	MS	F
Groups	5.9980	4	1.4995	1.46
Error	95.1958	93	1.0236	
Total	101.1939	97		

Item # 20 Methods and Techniques of classroom utilization of Television

Source	SS	df	MS	F
Groups	2.4871	4	0.6217	1.21
Error	47.6454	93	0.5123	
Total	50.1326	97		

Item # 21 Instructional Television Production

Source	SS	df	MS	F
Groups	1.4504	4	0.3626	0.65
Error	51.6107	93	0.5549	
Total	53.0612	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 22 Programmed Instruction

Source	SS	df	MS	F
Groups	3.5309	4	0.8827	1.62
Error	50.6731	93	0.5448	
Total	54.2040	97		

Item # 23 Fundamentals of Library Science

Source	SS	df	MS	F
Groups	0.9733	4	0.2433	0.25
Error	91.2307	93	0.9809	
Total	92.2040	97		

Item # 24 Computer Applications in Education

Source	SS	df	MS	F
Groups	3.6324	4	0.9081	1.45
Error	58.3675	93	0.6276	
Total	62.0000	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 25 Administration of Media Facilities

Source	SS	df	MS	F
Groups	0.5076	4	0.1269	0.27
Error	43.9821	93	0.4729	
Total	44.4897	97		

Item # 26 Public School Administration

Source	SS	df	MS	F
Groups	7.5564	4	1.8891	2.50*
Error	70.3312	93	0.7562	
Total	77.8877	97		

*Significant at the .05 level

Item # 27 Business Administration, including budget and finance

Source	SS	df	MS	F
Groups	1.5275	4	0.3818	0.47
Error	75.3805	93	0.8105	
Total	76.9081	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 28 Proposal Writing (for federal, state, and foundation grants, etc.)

Source	SS	df	MS	F
Groups	1.8059	4	0.4514	0.77
Error	54.2450	93	0.5832	
Total	56.0510	97		

Item # 29 Systems Theory and Design

Source	SS	df	MS	F
Groups	2.4921	4	0.6230	1.77
Error	32.7731	93	0.3523	
Total	35.2653	97		

Item # 30 Personnel Management/Development

Source	SS	df	MS	F
Groups	1.3687	4	0.3421	0.48
Error	66.6312	93	0.7164	
Total	68.0000	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 31 Curriculum Design and Development

Source	SS	df	MS	F
Groups	2.2623	4	0.5655	1.38
Error	38.1968	93	0.4107	
Total	40.4591	97		

Item # 32 Diffusion and Dissemination of Innovation (Change Theory)

Source	SS	df	MS	F
Groups	1.8528	4	0.4632	0.66
Error	64.9634	93	0.6985	
Total	66.8163	97		

Item # 33 Learning/Communications Theory

Source	SS	df	MS	F
Groups	0.2079	4	0.0519	0.23
Error	21.3941	93	0.2300	
Total	21.6020	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 34 Public Relations

Source	SS	df	MS	F
Groups	2.8963	4	0.7240	1.00
Error	67.6036	93	0.7269	
Total	70.5000	97		

Item # 35 Statistics

Source	SS	df	MS	F
Groups	8.6262	4	2.1565	3.29*
Error	61.0063	93	0.6559	
Total	69.6326	97		

*Significant at the .05 level

Item # 36 Research Method and Design

Source	SS	df	MS	F
Groups	1.3303	4	0.3325	0.69
Error	45.0778	93	0.4847	
Total	46.4081	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 37 Educational Psychology

Source	SS	df	MS	F
Groups	0.2463	4	0.0615	0.09
Error	63.9985	93	0.6881	
Total	64.2448	97		

Item # 38 Cybernetics

Source	SS	df	MS	F
Groups	4.9361	4	1.2340	1.66
Error	68.9821	93	0.7417	
Total	73.9813	97		

Item # 39 Philosophy of Education

Source	SS	df	MS	F
Groups	7.3206	4	1.8301	1.85
Error	92.0263	93	0.9895	
Total	99.3469	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 40 History of Education

Source	SS	df	MS	F
Groups	7.0082	4	1.7520	2.16
Error	75.4917	93	0.8117	
Total	82.5000	97		

Item # 41 Design of Media Facilities

Source	SS	df	MS	F
Groups	0.0856	4	0.0214	0.05
Error	44.1184	93	0.4743	
Total	44.2040	97		

Item # 42 Foreign Language Competency

Source	SS	df	MS	F
Groups	1.5565	4	0.3891	0.77
Error	46.7801	93	0.5030	
Total	48.3367	97		

ANALYSIS OF VARIANCE REPORT Continued

Item # 43 Work in a cognate area

Source	SS	df	MS	F
Groups	7.0152	4	1.7538	1.98
Error	82.3316	93	0.8852	
Total	89.3469	97		

Item # 44 Comprehensive oral and written examinations in major and cognate

Source	SS	df	MS	F
Groups	4.5268	4	1.1317	0.97
Error	108.0955	93	1.1623	
Total	112.6224	97		

Item # 45 Internship in Instructional Technology/Educational Communications

Source	SS	df	MS	F
Groups	6.2699	4	1.5674	3.16*
Error	46.1381	93	0.4961	
Total	52.4081	97		

*Significant at the .05 level

TABLE 10

NEWMAN-KEULS ANALYSIS

Item # 26 - Public School Administration

Groups	Means	Groups			
		M. S. U.	Syracuse	U. S. C.	Staff
Indiana	2.933	0.830* 3.691	0.746 2.935	0.654 2.832	0.742 1.762
Staff	2.461	0.358 1.517	0.274 1.038	0.182 0.753	
U. S. C.	2.279	0.176 0.912	0.092 0.406		
Syracuse	2.187	0.084 0.381			
M. S. U.	2.103				

*Significant at the .05 level

TABLE 11

NEWMAN-KEULS ANALYSIS

Item # 35 - Statistics

Groups	Means	Groups			
		U. S. C.	Staff	Indiana	M. S. U.
Syracuse	2.312	0.713* 3.150	0.697* 2.640	0.446 1.755	0.106 0.481
M. S. U.	2.206	0.607* 3.145	0.591 2.504	0.340 1.512	
Indiana	1.866	0.267 1.156	0.251 0.937		
Staff	1.615	0.016 0.066			
U. S. C.	1.599				

*Significant at .05 level

TABLE 12

NEWMAN-KEULS ANALYSIS

Item # 45 - Internship in Instructional Technology

Groups	Means	Groups			
		M. S. U.	Indiana	Staff	U. S. C.
Syracuse	1.875	0.703* 3.192	0.342 1.346	0.260 0.985	0.196 0.866
U. S. C.	1.679	0.507* 2.627	0.146 0.632	0.064 0.265	
Staff	1.615	0.443 1.877	0.082 0.306		
Indiana	1.533	0.361 1.605			
M. S. U.	1.172				

*Significant at the .05 level